CHAPTER 6. IMPLEMENTATION PLAN

6.1 Introduction

The Klamath TMDL establishes the allowable loadings or other quantifiable parameters for a waterbody that is the total permissible pollutant load that will achieve water quality standards. This "loading capacity" provides a reference for calculating the amount of pollutant reduction needed to bring a waterbody into compliance with water quality standards or designated uses. The TMDL identifies and assigns allocations to all sources of pollution, including waste load allocations to point sources and load allocations to nonpoint sources (40 CFR § 130 .2(i)). The rationale for the allocations and targets is provided in detail in Chapters 2 through 5 of the TMDL Staff Report.

The TMDL Program is the primary program responsible for achieving clean water where traditional controls on point sources have proven inadequate to do so. The program is charged with developing implementation plans that consider all sources and causes of impairment, and allocating responsibility for corrective measures that will attain water quality standards. This chapter of the staff report describes the Klamath TMDL implementation plan that implements the TMDL load allocations in the Klamath River basin in California pursuant to Water Code section 13242. This implementation plan includes measures in the Lost River basin and constitutes the implementation plan for the Lost River TMDL promulgated by the USEPA in 2008. It also implements site-specific water quality objectives for dissolved oxygen that were developed in conjunction with the Klamath TMDL (Appendix 1).

In developing the implementation plan, the Regional Water Board staff considered the nature of the discharges in the Klamath River basin as well as existing efforts to protect and restore water quality in the basin. The implementation plan proposes discrete and identifiable implementation measures that will bring the waterbody into compliance and it identifies the parties responsible for implementing those measures. It also describes the Regional Water Board's current regulatory strategy for controlling pollutant sources, recommends improvements to existing regulatory controls, and describes the recommended approach to controlling pollutant sources where traditional implementation controls may not apply or where the Regional Water Board lacks implementing jurisdiction. The plan sets time schedules by which the responsible parties will implement their compliance measures and also includes a monitoring plan to track progress towards compliance. The progress of the implementation plan will be tracked through basinwide monitoring of water quality trends as well as through discharger reporting of compliance measures. The Regional Water Board will make any necessary revisions to the implementation plan as needed to achieve water quality standards within a reasonable timeframe. Reassessment and monitoring of the TMDL is discussed in Chapter 7.

Restoration of water quality of the Klamath River requires coordinated basinwide implementation of TMDLs. The implementation plan includes the following measures to achieve this goal:

- A Memorandum of Agreement to coordinate implementation with the Oregon Department of Environmental Quality
- Development of an Memorandum of Agency Agreement with the US Bureau of Reclamation, US Fish and Wildlife Service, and Tulelake Irrigation District
- Measures to address the water quality impacts from the Klamath Hydroelectric Project
- Incorporation of Klamath TMDL requirements into point and nonpoint source permits as appropriate, including timber harvest permits and region-wide permits for Caltrans and the USFS
- Certification of the Five County Salmonid Protection Program to address sediment discharges from county roads
- Development of a conditional waiver by 2012 for discharges associated with agricultural activities, including grazing and irrigated agriculture.
- Adoption of a 'Thermal Refugia Protection Policy'
- Prohibition against unauthorized discharge of waste that violate water quality standards

6.1.1. *Geographic Scope*

Load allocations and targets are assigned to source categories on the mainstem Klamath, minor tributaries, and the mouths of major tributaries. The technical analysis does not include the Butte Valley Hydrologic Area. Major tributaries are not assigned temperature allocations because the Scott, Shasta and Salmon River watershed already have assigned allocations, and the Lost and Trinity are not listed as impaired for temperature. In contrast, the geographic scope of the implementation plan includes the entire Klamath Basin, and the plan also includes the implementation plan for the Lost River. The Regional Water Board may apply any existing authorities available in a basin plan amendment, and is not necessarily constrained by the scope of the technical TMDL process. Applying the scope of implementation to the entire Klamath basin allows for better coordination with existing programs and permits that may be working to improve water quality basinwide. Load allocations must be enforced through permitting mechanisms and incorporating TMDL implementation into a more broad based nonpoint source approach increases efficiency and consistency in regulation. Often the same types of management measures are needed to address water quality under the core regulatory nonpoint source program with or without the presence of the TMDL allocations. Where possible, it is sensible to combine water quality requirements under one permitting structure.

Staff received comments regarding implementation measures for agriculture, including the development of a basinwide conditional waiver as proposed in the previous draft. While the recommendation to develop an agricultural waiver remains in this draft, the interim requirements on agriculture have been removed, including the interim requirement to develop water quality and ranch management plans. Stakeholders requested the opportunity to develop regulatory measures for agriculture through a local stakeholder process. In response, Regional Water Board staff agree to focus staff resources on development of a locally supported program to address agriculture basinwide. The development of the waiver will proceed through a public stakeholder

process and be considered for adoption by 2012. In the meantime, the implementation plan includes interim recommendations for landowners to take in anticipation of the future agricultural water quality program. The Regional Water Board will consider whether to extend existing TMDL waivers in the Scott and Shasta with or without revisions or whether to or incorporate them into the proposed agricultural waiver as part of the Scott and Shasta waiver renewal process.

6.1.2 *Coordination with Oregon*

Achieving compliance with the Klamath River TMDLs in California and Oregon will require a coordinated approach that involves state and federal agencies as well as responsible parties in both states. To this end, the Regional Water Board, Oregon Department of Environmental Quality (ODEQ), and USEPA Regions 9 and 10 have signed a Memorandum of Agreement (MOA) for implementing the Klamath River basin TMDLs.

Coordinating implementation will focus restoration and regulatory programs on both short-term and long-term goals for the basin. The regulatory process will accommodate short-term measures working in concert with longer-term programs to achieve full compliance over a longer time frame. Short-term measures are needed to immediately lessen the threat to cold water fishery and tribal cultural beneficial uses, among others. Regional Water Board staff encourage implementation of large scale, centralized projects designed to reduce nutrient loads to the Klamath River in Oregon and California. Fundamental for the control of nutrient loads to the Klamath River is coordinating with the U.S. Bureau of Reclamation (USBR) to address discharges from the Klamath Irrigation Project. To this end, Regional Water Board staff propose development of a Memorandum of Agency Agreement with USBR to control discharges to the Klamath River. In addition, Regional Water Board staff are working with ODEQ and USEPA Regions 9 and 10 in cooperation with PacifiCorp to develop a Klamath basin water quality improvement tracking and accounting program. As planned, this program will provide a mechanism that would allow for collaboration among basin stakeholders on common projects while earning credit towards their regulatory requirements related to TMDLs (See Section 6.7).

6.1.3 *Klamath Hydroelectric Project, Klamath Basin Restoration Agreement, and Dam Removal Agreement*

The Klamath River TMDLs assign load allocations and targets at levels necessary to achieve water quality standards, including the recalculated SSO for DO as presented in Appendix 1, within the Klamath Hydroelectric Project (KHP) area. Regulation and enforcement of the TMDL allocations is traditionally through the State Water Board water quality certification process that accompanies renewal of a license issued by the Federal Energy Regulatory Commission (FERC). As described in more detail below, certain parties have been engaged in settlement negotiations that contemplate the voluntary removal of the KHP. Because the regulatory process and outcome of the settlement negotiations is largely outside of the Regional Water Board's control, the Klamath River TMDLs accommodate various alternatives by allowing the use of offsets

focused on offsite nutrient reduction for an interim period while options for infrastructure improvements and dam removal are studied.

The Klamath Basin Restoration Agreement (KBRA) is a negotiated settlement agreement among as many as 26 different parties and is designed to settle long-standing disputes in the Klamath River basin. It focuses on water allocations in the upper basin, provides for fisheries restoration, and is structured around the central assumption that an agreement to remove the lower four Klamath River dams will be reached. On November 13, 2008, an Agreement in Principle (AIP) to remove four Klamath River dams was announced after negotiations among representatives of the federal government, the state of California[1], the state of Oregon, and PacifiCorp. The Regional Water Board was not a party to the KBRA nor AIP negotiations. A draft of the final Klamath Hydroelectric Settlement Agreement (KHSA) was released on September 30, 2009. Settlement Parties contemplate federal legislation that would indefinitely delay the relicensing process before the FERC and accompanying Clean Water Act section 401 permitting process before the SWRCB. (See section 6.5 of the draft Agreement [Abeyance of Relicensing Proceeding].) The Regional Water Board staff provided input to the KHSA parties on appropriate interim water quality measures and regulatory pathways for TMDL compliance.

6.1.4 *Nonpoint Source Land Use Activities and Controls*

Implementation actions taken to achieve load allocations must be consistent with the *Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program* (State NPS Policy). This policy requires that "all current and proposed nonpoint source discharges must be regulated under waste discharge requirements (WDRs), waivers of WDRs, a Basin Plan prohibition, or some combination of these tools (Regional Water Board 2007, p.4-33.00)." For some pollutant sources, the method of compliance with this policy is already in place, and if it is determined to be sufficient, no further action by the Regional Water Board is necessary. However, if the source is currently unregulated, or the current permits, waivers and/or prohibitions are not sufficient to attain the TMDL, a means to comply with the State NPS Policy must be proposed as part of the implementation plan.

The threats to water quality from nonpoint source activities in the Klamath River basin are mainly associated with timber harvest, roads, grazing, and irrigated agriculture on private and federal lands. The implementation plan focuses on reducing nutrient loading in the upper basin, controlling sediment discharges, and protecting riparian vegetation in the tributaries downstream of Iron Gate Dam in accordance with the technical TMDL allocations. In response to numerous comments received, staff have removed interim requirements on individual landowners and operators discharging waste associated with agriculture, grazing and roads not already covered by a permit or waiver in lieu of incorporating TMDL implementation into basin and/or region wide nonpoint source programs for efficiency and consistency.

[1] State of California is defined as the State of California Resources Agency and its constituent departments and excludes all other state agencies, departments, boards and commissions. The Regional Water Board is not a constituent department under the Resources Agency.

To protect against serious and significant individual threats to water quality, staff proposes the adoption of a prohibition against discharges of waste that violate water quality standards. This prohibition is a restatement of existing law and is not intended to provide a nonpoint source program that implements measures to control the cumulative impact of individual nonpoint source discharges of waste. Individuals who believe they may need permit coverage for their discharges should contact the Regional Water Board and inquire about obtaining an individual permit. Also in response to numerous comments from individual landowners, staff has removed the conditional sediment prohibition that included requirements to control sediment discharges. The implementation plan now provides Guidance on the Control of Excess Sediment that will help address sediment sources in the Klamath River basin. The implementation plan also proposes a Thermal Refugia Protection Policy that provides enhanced protection of thermal refugia in specific locations on the Klamath mainstem.

With the exception of existing waste discharge requirements (WDRs) and waivers for timber harvest and TMDL waivers adopted as part of the Scott and Shasta River TMDLs, the Regional Water Board has not adopted a regulatory program for discharges of nonpoint source pollution as required by the State Nonpoint Source Policy. To address this and other gaps in regulation, the implementation plan recommends development of regionwide programs for controlling discharges from land use activities that discharge waste and contribute to the water quality impairments. It is the Regional Board staff recommendation to enforce TMDL requirements through basinwide and regionwide programs where possible, rather than piecemeal various requirements in each TMDL action plan. Table 6.1 provides an overview of Regional Water Board staff recommendations of regulatory mechanisms to implement the TMDL allocations in the Klamath River basin in California.

Table 6.1: Existing and Proposed Permitting

Nonpoint Source Regulatory Mechanism	Existing/New (Timeframe)	Responsible Party
Timber Harvest WDRs and waiver on Nonfederal lands	Existing	All parties conducting timber harvest activities on nonfederal lands in the Klamath River basin
Waiver for nonpoint source discharges associated with certain activities on lands managed by the USFS	New (2010)	USFS
Waiver for discharges associated with agriculture including irrigated agriculture and grazing	New (2012)	Parties discharging in association with agricultural activities in the Klamath River basin in California
Waiver Certifying 5C Program for County Roads	New (2010)	Del Norte, Humboldt, Siskiyou, and Trinity Counties
Statewide NPDES Stormwater Permit for Caltrans Activities	Existing	Caltrans

6.1.5 *Implementation Plan Development and Consideration of Relevant Factors*

On February 19, 2009, the Regional Water Board circulated a draft scoping document for TMDL implementation called the *Water Quality Restoration Plan for the Klamath River Basin in California: Draft Scoping for TMDL Implementation* (Regional Water Board 2009). Regional Water Board staff held five public workshops where an overview of the impairments and potential implementation measures was provided. The document includes an overview of draft load allocations, identifies potential responsible parties, and potential permitting and other applicable implementation mechanisms. The document discusses implementation challenges of controlling sources where traditional controls may not apply or where the Regional Water Board lacks implementing jurisdiction. Readers were encouraged to provide Regional Board staff with any relevant information on implementation, including, but not limited to:

- source inputs not previously identified,
- current efforts to address the TMDL pollutants and any documented success of such efforts,
- other programs that could be incorporated into an implementation plan strategy,
- how to maximize the efficiency of implementation strategies for water quality improvement,
- benefits and burdens of different implementation approaches,
- suggestions for tracking implementation and progress towards meeting water quality standards (i.e. compliance and trend monitoring), and
- potential restoration ideas and other creative solutions for improving water quality in the Klamath Basin.

Regional Water Board staff received numerous submittals that helped inform the development of the proposed implementation plan and received additional input from stakeholders on the June draft Staff Report documents.

This implementation plan reflects the consideration and balancing of various relevant factors including, cost, equity, magnitude of impact, degree of management controls in place, feasibility, and probability of success. For example, the plan acknowledges that the allocation at stateline will require an unprecedented level of cooperation between the states and federal government to achieve pollutant loading reductions necessary to meet water quality objectives and support beneficial uses in both states. Focus on implementation in Oregon is equitable considering its large contribution to the Klamath impairments. This led to the formation of a Management Agency Agreement with Oregon and EPA to help coordinate implementation, including implementation in the Lost River basin. This approach is guided by feasibility, degree of management controls in place, probability of success, political and other considerations.

In addition, the plan proposes structuring a pollutant Tracking and Accounting Program to encourage the implementation of engineered treatment options. The program is intended to provide some flexibility to implementation through the allowance of offsets and time schedules and will consider engineering constraints, costs, feasibility, and other

factors. Rather than implement very costly retrofits that may not yield large improvements to overall water quality, contributions toward coordinated restoration efforts are encouraged to maximize water quality improvements through resource consolidation.

The Regional Water Board recognizes that the Klamath Hydroelectric Project will undergo one of two possible processes; either the FERC relicensing and 401 Water Quality Certification process, or the KHSA route. Each are driven by concerns in addition to water quality and will necessarily be decided by a different agency after thorough analyses. The implementation plan allows PacifiCorp to submit a proposed plan that accommodates the possible regulatory processes which reflects staff's consideration of legal feasibility and management controls in effect.

Finally, in this most recent draft, the implementation plan provides a more coordinated and consistent approach to nonpoint source pollution control in response to comments regarding economic impacts from regulation of individual landowners. This plan removes additional interim nonpoint source requirements on individual landowners and instead proposes the development of a sensible agricultural waiver, in collaboration with stakeholders, which will provide water quality protection in the least burdensome way. Where possible, staff identifies requirements by other agencies that meet TMDL needs in order to consolidate monitoring and avoid inconsistent terminology. Parties are encouraged to submit any additional and specific information for the Regional Water Board's consideration in this third opportunity for public review of the Klamath TMDL.

6.1.6 *Implementation Plan Organization*

This implementation chapter is organized according to the source areas identified in the technical TMDL. Each section provides a summary of the load allocations and targets for that source area, identifies the parties responsible for meeting those allocations, and discusses the Regional Water Board staff's approach to implementation and recommended implementation actions for the responsible parties.

The source areas receiving allocations and targets are:

1. Stateline (section 6.2)
2. Klamath Hydroelectric Project (KHP) and Iron Gate Hatchery (section 6.3)
3. Klamath River tributaries (section 6.4)
4. Watershed-Wide Nonpoint Source Land Use Activities (sections 6.5 and 6.6)

The presentation of the watershed-wide implementation actions in section 6.5 begins with a description of actions to address watershed-wide temperature allocations, proposed Prohibition on discharges of waste that violate water quality standards, and the Thermal Refugia Protection Policy, followed by discussion of the following land use activities:

- Road construction and maintenance;
- Agriculture including grazing and irrigation agriculture; and
- Timber harvest.

Implementation actions associated with all land use activities on federally managed lands are presented in section 6.6. The Klamath River water quality improvement Tracking and Accounting Program is described in section 6.7.

6.2 Stateline

The Oregon-California stateline (Stateline) is the point at which the Klamath River crosses the Oregon-California border, and is designated as a compliance point in the Klamath TMDL. The pollutant loads in the Klamath River entering California are the result of loadings in Oregon, including the Lost River basin, which is partially in California. Nutrient loads in the Klamath River at stateline originate mainly from Upper Klamath Lake, as well as from the Lost River basin through the Klamath Straits Drain and Lost River Diversion Channel, and to a lesser extent from point sources in Oregon. Nutrients coming from these sources contribute to DO and pH swings downstream, as well as to aquatic plant growth within the river and blue-green algae blooms within the Copco and Iron Gate reservoirs in California.

6.2.1 *Allocations and Targets*

The ODEQ has identified the Klamath River in Oregon on its CWA section 303(d) list as failing to meet Oregon water quality criteria. Accordingly, in 2010, ODEQ intends to issue and implement TMDLs addressing temperature, dissolved oxygen, pH, ammonia, and chlorophyll-a impairments for the Klamath River in the state of Oregon. These Oregon-issued TMDLs will be based on Oregon's water quality standards. Because these TMDLs (and their anticipated load and wasteload allocations) are being developed by Oregon as part of a comprehensive multistate analysis of pollutant loadings to the Klamath River, they are also being designed to meet California water quality standards at stateline. It is appropriate for the Regional Water Board to account for these anticipated upstream load reductions in Oregon when developing the TMDLs for the segments of the Klamath River that are downstream in California. The Regional Water Board's Klamath River TMDLs for California assign nutrient, organic matter, and temperature allocations, as well as temperature and dissolved oxygen targets at stateline. These allocations and targets at stateline are presented in sections 5.2.2 and 5.3.1 and reflect anticipated water quality at stateline once the Oregon TMDLs are fully implemented. Improvements in water quality in Oregon represent a critical part of the solution in meeting water quality objectives in California.

6.2.2 *Responsible Parties*

Point and Nonpoint Sources in Oregon and Lost River basin in California
Regional Water Board
Oregon Department of Environmental Quality
Oregon Department of Agriculture
USEPA Regions 9 and 10

6.2.3 *Implementation*

6.2.3.1 Oregon

Consistent with Oregon Administrative Rules (OARs), ODEQ is responsible for developing an implementation plan, called a Water Quality Management Plan (WQMP), to meet the Klamath and Lost River TMDLs in Oregon. The OARs establish the required elements of WQMPs, which include the following:

- Identification of management measures to meet load allocations;
- A timeline for implementation with measureable milestones;
- A timeline for attainment of water quality standards;
- A monitoring plan; and
- General discussion of costs and funding for implementation.

The OARs also require the WQMP to identify persons and agencies responsible for implementation; as well as provide reasonable assurance that implementation will occur through either regulatory or voluntary means. A main difference between TMDL implementation planning in Oregon and California is that ODEQ does not specify the nature of the actions responsible parties are expected to take and is not charged with enforcing the TMDL load allocations and targets directly. Instead, ODEQ implementation plan designates management agencies (DMAs) that must develop 'sector or source specific' implementation plans (also called WQMPs) that meet the TMDL load allocations. DMAs designated in ODEQ's TMDL will likely include USBR, Oregon Department of Agriculture, and the Irrigation Districts. The WQMPs are subject to approval by ODEQ, but the DMAs maintain the primary authority to enforce the measures in those plans.

Oregon Department of Agricultural (ODA) fulfills its requirement to develop a WQMP pursuant to an existing program established by Oregon Senate Bill 1010. SB 1010 requires ODA to develop administrative rules specific to hydrologic 'subareas' in Oregon. The administrative rules describe water quality requirements for landowners and consist of a description of the subarea, a list of unacceptable water quality conditions, and a process for complaints and investigations. The unacceptable conditions include excessive sheet and rill erosion and downward trending riparian conditions as defined by US Bureau of Land Management (BLM) technical guidelines. Landowners are also prohibited from degrading stream shading consistent with site capability – similar to the California riparian shade allocation.

Landowners are directed by Oregon Senate Bill 1010 to develop Agricultural Water Quality Management Plans that implement the administrative rules and control water pollution resulting from agricultural activities. A Local Advisory Committee typically represents the landowners in development of both the area administrative rules and the management area plans with oversight by ODA. The area management plans include provisions for ODEQ to work with ODA to monitor progress towards plan implementation including the effectiveness of the plan in meeting applicable TMDL load allocations. The rules are enforceable, while the plans are not. The plan in the Lost

River basin in Oregon is called the Lost River Subarea Agricultural WQMP and is implemented by the Klamath Soil and Water Conservation District.

ODA maintains primary authority to regulate agriculture to protect water quality. Since ODEQ authority is secondary, it is important for ODA to effectively use its authority in order to achieve the Klamath and Lost River TMDL load allocations and targets in Oregon with oversight by ODEQ. The strength of Oregon's agricultural water quality management program is its focus on landowner driven efforts. By working with the KSWCD in the Lost River basin, landowners have already implemented management measures and water quality improvement projects that address the TMDL pollutants. It is important for ODA to continue to use its authority as appropriate to achieve the Klamath and Lost River TMDL load allocations and targets in Oregon. Regional Water Board staff support the following measures to coordinate the Oregon SB 1010 water quality program with TMDL implementation:

- Update the Oregon Administrative Rules for the Lost River subbasin Area to address nutrients and organic matter in irrigation tailwater;
- Incorporate TMDL implementation measures and timelines into the Lost River Agricultural Water Quality Management Plan;
- Conduct water quality monitoring to track the progress of TMDL implementation towards meeting allocations and targets; and
- Periodic review by ODA and ODEQ to ensure the TMDL requirements are being met.

6.2.3.2 Regional Water Board's Role

The Regional Water Board intends to work closely with ODEQ and ODA in implementing the Klamath and Lost River TMDLs. One of the purposes of coordination with Oregon is to align each state's approach to controlling nonpoint sources of pollution. Currently, the major difference between the states is the regulatory framework and the enforcement authorities of the water quality control agencies in each state. In California, the Regional Water Board is required by the State NPS Policy to regulate all sources of waste, including agricultural activities, directly through permits, waivers and/or prohibitions, as discussed in section 6.1.4. The Regional Water Board has broad enforcement capabilities to ensure compliance with the terms and conditions of permits and prohibitions. While the Regional Water Board's regulatory authority is broader than ODEQ's, the implementation measures required to achieve the TMDL are similar in both states. For the USBR and USFWS, the implementation plan measures include an evaluation and implementation of methods to reduce the water quality impacts of the operation of the Klamath Irrigation Project and the Klamath River basin Wildlife Refuges and implementation of an effective pollutant reduction strategy. Implementation measures for USBR and USFWS are discussed in section 6.4.3.

6.2.3.3 Memorandum of Agreement to Coordinate State and Federal Agency TMDL Implementation Actions in the Klamath River Basin

Klamath TMDL implementation will be coordinated with the ODEQ and the USEPA. The Regional Water Board, ODEQ, and EPA Regions 9 and 10 have developed a

Memorandum of Agreement (MOA) that establishes a framework for joint implementation of the Klamath River and Lost River TMDLs. The MOA includes commitments such as:

- Work to develop and implement a joint adaptive management program, including joint time frames for reviewing progress and considering adjustments to TMDLs;
- Work with the Klamath Basin Water Quality Monitoring Coordination Group and other appropriate entities to develop and implement basinwide monitoring programs designed to track progress, fill in data gaps, and provide a feedback loop for management actions on both sides of the common state border;
- Work jointly with common implementation parties (e.g., USBR, U.S. Forest Service, USFWS, BLM, PacifiCorp, and the Klamath Water Users Association (KWUA) to develop effective implementation plans and achieve water quality standards;
- Explore engineered treatment options such as treatment wetlands, algae harvesting, and package wastewater treatment systems to reduce nutrient loads to the Klamath River and encourage implementation of these options where feasible; and
- Work to develop and implement a basinwide water quality tracking and accounting program that would establish a framework to track water quality improvements, facilitate planning and coordinated TMDL implementation, and enable appropriate water quality offsets or trades.

Stateline Implementation Measures

Regional Water Board, Oregon (ODEQ) and USEPA 9 and 10:
Measure

- Work together as specified in the Klamath River/Lost River TMDL Implementation Memorandum of Agreement developed to implement and monitor measures that will achieve compliance with the Klamath And Lost River TMDLs in Oregon and California.

6.3 Klamath Hydroelectric Project and Iron Gate Hatchery

6.3.1 *Klamath Hydroelectric Project*

The KHP is a federally licensed project owned and operated by PacifiCorp and consists of eight facilities in California and Oregon. The implementation plan will address the impacts of the project facilities in California, which includes the following three dam/reservoir pairs: Copco 1, Copco 2, and Iron Gate. Figure 6.1 shows all the dams on the Klamath River. All except Link River Dam are part of the KHP. The Fall Creek Dam is located on Fall Creek, not the Klamath River.

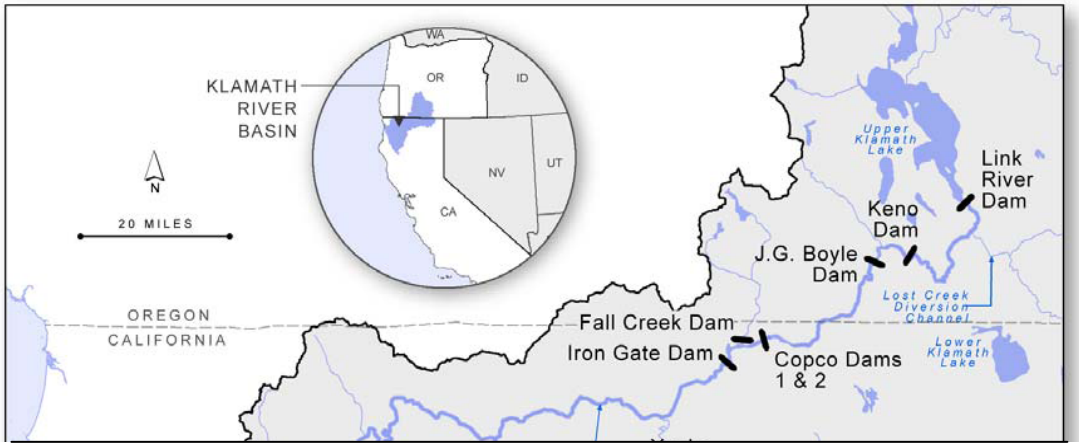

Figure 6.1: Map of Klamath Hydroelectric Project Facilities. Link River Dam is not part of KHP.

The technical TMDL analysis found that the KHP contributes to the impairment of the Klamath River by:

- Altering the nutrient dynamics of the river, and contributing to biostimulatory conditions in the summer/fall growing season;
- Creating physical conditions that promote nuisance blooms of suspended algae, including toxin-forming blue-green algae species;
- Creating low dissolved oxygen and high temperature conditions within the reservoirs and at the tailraces; and
- Altering the temperature regime in the Klamath River downstream.

6.3.1.1 Allocations and Targets

The TMDL includes allocations and targets for the KHP facilities in California. The allocations and targets assigned to meet water quality standards in the reservoirs include a temperature/DO compliance lens, nutrient allocations, as well as nutrient and organic matter targets, and algae-based targets. In addition, temperature allocations and temperature, DO, nutrient and organic matter targets are assigned to the reservoir tailraces. See sections 5.2.3 and 5.3.2 for a complete discussion of these allocations and targets.

6.3.1.2 Responsible Parties

Regional Water Board
State Water Resources Control Board (State Water Board)
PacifiCorp

6.3.1.3 Implementation

To comply with the TMDL, PacifiCorp must implement management measures that result in attainment of the load allocations and targets to the KHP facilities in California. Regulation and enforcement of these TMDL allocations is traditionally through the State Water Board Clean Water Act section 401 water quality certification process, since the Regional Water Board is preempted from issuing a permit to the KHP. The KHP is

licensed by FERC with a license that expired on March 1, 2006. The KHP continues to operate under an annual license until renewal. Renewal of the license requires compliance with the California Environmental Quality Act (CEQA) and the issuance of a Clean Water Act section 401 water quality certification by the State Water Board. In issuing water quality certification, the state may impose conditions on the KHP in order to certify that the project protects beneficial uses and meets water quality objectives as specified in the Basin Plan. The Klamath TMDLs, upon adoption, will become part of the Basin Plan and will thus become part of the comprehensive plan that FERC must consider as part of its licensing decision. As authorized by section 401, the State Water Board will apply appropriate state water quality requirements through the FERC licensing proceeding as part of its decision to issue or deny water quality certification.

In 2004, FERC prepared a Final Environmental Impact Statement (FEIS) that describes the positive and negative environmental effects of the proposed action to relicense the continued operation of the KHP, and alternative actions, including decommissioning all or part of the project. As part of the 401 certification proceeding, the State Water Board is preparing an Environmental Impact Report (EIR) since the FEIS does not fully comply with CEQA (State Water Board 2008). The FEIS will form the basis of the EIR, and the State Water Board has initiated the process of soliciting information from stakeholders regarding the adequacy of the FEIS and the scope of the EIR. The EIR will evaluate four alternatives for operating the KHP, two of which include removal of two and four of the KHP dams, respectively. Regional Water Board staff will continue to participate in the FERC relicensing and 401 process at the State Water Board to provide information and consultation to ensure that the KHP meets water quality standards and other Basin Plan requirements.

On November 13, 2008, an Agreement in Principle (AIP) to remove four of the Klamath River dams (JC Boyle, Copco 1 and 2, and Iron Gate) was announced after negotiations between the representatives of the federal government, the state of California, the state of Oregon, and PacifiCorp. The Regional Water Board was not a party to the negotiations. A draft of the final Klamath Hydroelectric Settlement Agreement (KHSA) was released on September 30, 2009. Settlement Parties contemplate federal legislation that would indefinitely delay the relicensing process before the FERC and accompanying Clean Water Act section 401 permitting process before the SWRCB. (See section 6.5 of the draft KHSA [Abeyance of Relicensing Proceeding].) In contemplation of the absence of the FERC/401 process, Regional Water Board staff participated in discussions about how the Parties view the regulatory pathways envisioned in the draft KHSA and their relationship to Oregon and California's TMDLs. This is reflected in section 6.3 of the draft KHSA released on September 30, 2009. Section 6.3.2 of the KHSA provides:

> 6.3.2 TMDL Implementation Plans
>
> A. No later than 60 days after ODEQ's and the North Coast Regional Water Quality Control Board (NCRWQCB)'s approval, respectively, of a TMDL for the Klamath River, PacifiCorp shall submit to ODEQ and NCRWQCB, as applicable, proposed TMDL implementation plans for agency approval. The TMDL implementation plans shall be developed in consultation with ODEQ and NCRWQCB.

> B. To the extent consistent with this Settlement, PacifiCorp shall prepare the TMDL implementation plans in accordance with Oregon Administrative Rules (OAR) 340-042-0080(3) and California Water Code section 13242, respectively. The plans shall include a timeline for implementing management strategies and shall incorporate water quality-related measures in the Non-ICP Interim Measures set forth in Appendix D. Facilities Removal by the Designated Removal Entity (DRE) shall be the final measure in the timeline. At PacifiCorp's discretion, the proposed plans may further include other planned activities and management strategies developed individually or cooperatively with other sources or designated management agencies. ODEQ and NCRWQCB may authorize PacifiCorp's use of offsite pollutant reduction measures, subject to an iterative evaluation and approval process; provided, any ODEQ authorization of such offsite measures conducted in Oregon solely to facilitate attainment of load allocations in California waters shall not create an ODEQ obligation to administer or enforce the measures.

Under section 3.3 of the draft KHSA, the Secretary of the Department of the Interior will conduct very detailed studies and assessments to determine, *inter alia*, whether dam removal (i) will advance restoration of the salmonid fisheries of the Klamath Basin, and (ii) is in the public interest. The Secretary is to make a determination by March, 2012, subject to various contingencies, on whether to move forward with the project. As part of this process, a detailed plan for facility removal will be developed that describes the " physical methods to be undertaken to effect Facilities Removal, including but not limited to a timetable for Decommissioning and Facilities Removal, which is removal of all or part of each Facility as necessary to effect a free-flow condition and volitional fish passage." (KHSA, section 3.3.2.)

In its comments on the draft TMDL Action Plan, PacifiCorp objected to the 60 day time frame to submit its proposed implementation plan. Regional Board staff do not object to revisiting the time frame for submittal, and in fact hope to align it with Oregon's TMDL requirements to the extent possible for efficiency. (Note: OR is responsible for water quality certification of J.C. Boyle, one of four hydroelectric facilities in the KHP.) However, the suggestion to allow eighteen months does not seem appropriate here, particularly because the bulk of PacifiCorp's implementation has already been defined in various interim measures agreed to by Settlement Parties.

Since PacifiCorp is a Party to the KHSA and understands its intricacies, it may propose timelines in its implementation plan that best align with the timelines contained in the Settlement. The implementation plan should identify appropriate intervals whereby PacifiCorp will provide the Regional Water Board updates on the status and progress of the plan. At a minimum, the Regional Water Board will want to review the plan in 2012 in light of the Secretary's Determination. Based on the evidence and analyses conducted pursuant to the Secretarial Determination, and the substantive conclusions by the Department of Interior, the Regional Water Board will revisit the content of the KHP implementation plan. In addition, the proposed implementation plan must include a mechanism for Regional Water Board approval of offset projects described in more detail below. Regional Water Board staff are flexible about how this may occur, but the plan

must be formulated with the goal of having approved projects ready for implementation in the event of an Affirmative Determination.

Section 6.3.2 of the KHSA describes generally the content of the implementation plan to include a timeline for implementing management strategies, water quality-related measures in Appendix D, and Facilities Removal as the final measure. The proposed plan may further include other planned activities and management strategies developed individually or cooperatively with other sources or designated management agencies. Appendix D contains water-quality measures that could potentially serve to meet TMDL needs if implemented effectively. As described in more detail below, Interim Measures 10 and 11 have significant potential to contribute towards meeting the Klamath River TMDL load allocations and targets in California. PacifiCorp may propose the use of offsite pollutant reduction measures (i.e. offsets or "trades") to meet the allocations and targets, including those for Iron Gate Hatchery (section 6.3.1.3). Candidate offsite pollutant reduction measures should be informed by Interim Measures 10 and 11 (discussed below) and credits determined through the water quality improvement Tracking and Accounting Program (TAP) (section 6.7).

Interim Measure 10 provides funding for a water quality conference that focuses on the design and implementation of nutrient and organic matter reduction projects. The conference should assess the appropriateness and feasibility of various centralized pollutant removal technologies, including wetland treatment systems, wastewater treatment systems with energy recovery capabilities, aquatic plant harvesting, as well as agricultural best management practices. The conference serves as an opportunity to bring together water quality restoration experts, with the objective of developing recommendations and preliminary conceptual design for projects to achieve large-scale nutrient and organic matter reductions in the basin.

Interim Measure 11 provides funding for interim water quality improvements and is critical for achieving large-scale nutrient reductions in the basin. Under this Interim Measure, PacifiCorp spends $250K/yr until the date of Secretarial Determination to be used for studies or pilot projects. By the date of the Secretarial Determination, a priority list of projects will be developed, informed by the water quality conference and Secretarial Determination studies. In the event of an Affirmative Determination by the Secretary, PacifiCorp provides funding of up to $5.4 million for implementation of projects and $560K/year for operation and maintenance of such projects. As stated in the KHSA, the "purpose of this measure is to improve water quality in the Klamath River during the Interim Period leading up to dam removal. The emphasis of this measure shall be nutrient reduction projects in the watershed to provide water quality improvements in the Mainstem Klamath River, while also addressing water quality, algal and public health issues in Project reservoirs…."

Regional Water Board staff agree that Interim Measure 11 should focus on the development and implementation of nutrient reduction projects, building upon ideas generated from the Interim Measure 10 water quality conference. PacifiCorp should focus on offsets in its proposed implementation plan, and commit to the goal of having

viable projects ready for implementation by the date of the Secretarial Determination. Further, a list of priority projects should be completed by PacifiCorp and the Implementation Committee, and select project(s) should be ready for construction by the date of the Secretarial Determination. That means that projects must be presented to the Regional Water Board prior to the Secretarial Determination date with adequate time for review.

The Klamath Hydroelectric Settlement Agreement includes the formation of an Interim Measures Implementation Committee (IMIC - Interim Measure 1) for the purpose of collaborating with PacifiCorp on "ecological and other issues related to the implementation of the Interim Measures set forth in Appendix D" (KHSA, Appendix B). The IMIC will meet, discuss, and seek to reach consensus on implementation of various Interim Measures, including Interim Measure 11. Though not a Party, Section 3.2 of Appendix B states that the North Coast Regional Water Board may be a member of the IMIC, and the Regional Water Board intends to have a staff representative participate on the IMIC with the purpose of providing guidance on a project's potential to meet TMDL requirements. As previously stated, the TMDL implementation plan must provide for separate updates and presentations to the Regional Water Board for approval. The IMIC is not involved in Interim Measure 10: Water Quality Conference. This measure states that PacifiCorp, the North Coast Regional Water Quality Control Board, and the Oregon Department of Environmental Quality, will convene a steering committee to develop the agenda and panels for the water quality conference. The Regional Water Board intends to work closely with ODEQ and PacifiCorp on Interim Measure 10.

Interim Measure 11 also identifies the development of a water quality tracking and accounting framework. Regional Water Board staff support PacifiCorp's involvement in developing a water quality improvement tracking and accounting program for the Klamath River basin. The purpose of the program is to provide a structure that facilitates the efficient application of offset programs by consolidating contributions and distributions. Consistent with the stated purpose of Interim Measure 11 and the goal of TMDL compliance, the majority of PacifiCorp's funding should be focused on the development and implementation of on-the-ground projects that, once implemented, will provide water quality improvements in the mainstem Klamath River.

The Interims contain valuable monitoring provisions and also a Coho Enhancement Fund and turbine venting project that could positively influence water quality. Water quality monitoring performed under Interim Measure 15 will be valuable in tracking baseline water quality conditions and compliance with the TMDLs.

The TMDL accommodates a variety of implementation options to address reservoir-related water quality impairments depending on whether the settlement moves forward or the State Water Board and FERC processes continue. Regardless of the process, PacifiCorp must implement measures designed to move toward compliance with TMDL allocations and protection of beneficial uses. This is true for any process that proposes continued operation of the KHP, as well as for any alternative that considers dam removal. In addition, PacifiCorp must implement adequate water quality control

measures to offset on-going reservoir impacts while the reservoirs are modified to meet the load allocations or, alternatively, up to the time they are decommissioned. PacifiCorp may propose the use of offsite pollutant reduction measures in the interim period consistent with the Klamath River water quality improvement tracking and accounting program, subject to an iterative evaluation and approval process. The implementation plan submitted by PacifiCorp should provide certain time periods after which a reassessment process may occur to avoid having to develop an alternative plan in the event that the settlement is discontinued. For now, we think that the acknowledgement that the FERC/401 process resumes if the settlement terminates will suffice. If that occurs, the Regional Water Board will revisit PacifiCorp's implementation plan to discuss possible revisions. The implementation plan must also provide for Regional Water Board review of more site specific environmental assessments of dam removal before approval of that approach as a final TMDL compliance measure.

Implementation Measures for the Klamath Hydroelectric Project

PacifiCorp:
Measure
- Submit a proposed implementation plan for approval by the Regional Water Board consistent with section 6.3.2 of the KHSA. The plan should further delineate the timelines for implementation of Interim Water Quality Measures in the KHSA and provide for periodic update of the plan. At a minimum, the plan shall include a reassessment by the Regional Water Board in 2012 in light of the Secretarial Determination.

Timeline
- Within 60 days from the date of TMDL adoption by the Regional Water Board

Measure
- Implement measures to meet and/or offset TMDL allocations and targets as prescribed in the approved implementation plan.

Timeline
- As required by the approved implementation plan.

State Water Board:
Measure
- If applicable, process the 401 water quality certification for the Federal Energy Regulatory Commission (FERC) relicensing of the Klamath Hydroelectric Project to meet Basin Plan requirements, including Klamath TMDL allocations and targets.

Timeline
- Pursuant to the FERC licensing process timeline.

6.3.2 *Iron Gate Hatchery*

Iron Gate Fish Hatchery is owned by PacifiCorp and operated by the California Department of Fish and Game (CDFG). The hatchery is located at the base of Iron Gate Dam and discharges effluent under NPDES Permit No. CA0006688 and WDR No. R1-2000-17.

6.3.2.1 Allocations and Targets

The TMDL assigns temperature, nutrient, and organic matter waste load allocations, as well as temperature, DO, nutrient and organic matter targets to discharges from Iron Gate Hatchery. These allocations and targets are presented in sections 5.2.4 and 5.3.3.

6.3.2.2 Responsible Parties

Regional Water Board
PacifiCorp
California Department of Fish and Game

6.3.2.3 Implementation

The waste load allocations to the Iron Gate Hatchery discharges will be implemented through the federal NPDES permit, which is held jointly by CDFG and PacifiCorp. The current permit passed its expiration date in August 2004, and the hatchery continues to operate under the terms of the existing permit until a new permit is issued. The TMDL wasteload allocations and targets to the hatchery discharge will be translated into effluent limits in the new NPDES permit. The TMDL compliance schedule to accompany the new permit may allow additional time needed for CDFG to make any infrastructure improvements to the hatchery and to implement management measures that meet TMDL allocations. The time schedule will include specific intermediate milestones with the final goal of meeting the Klamath TMDL allocations and targets. Intermediate milestones for pollutant reductions in the hatchery discharges may include:

1. Improving effluent water quality to the level of the intake water to the hatchery; and
2. Meeting current receiving water quality in the Klamath River at the point of discharge.

The hatchery may have the option of achieving some or all of its load reductions through offset mitigation if the potential changes to hatchery operations are limited in their ability to effectively reduce pollutant loads. Any offset mitigation would be coordinated through the Klamath River water quality improvement tracking and accounting program (section 6.7).

Implementation Measures for Iron Gate Hatchery

Regional Water Board:

Measure

- Revise NPDES Permit No. CA0006688 and WDR No. R1-2000-17 to incorporate revised effluent limits to implement the TMDL wasteload allocations, and the recalculated site-specific objectives for dissolved oxygen, and require that the responsible parties implement measures to improve the water quality of discharges from the Iron Gate Hatchery to meet TMDL allocations and targets on a compliance schedule.

Timeline

- Adoption by the Regional Water Board by December 2010.

PacifiCorp and CDFG:

Measure

- Implement measures to improve the water quality of discharges from the Iron Gate Hatchery to meet and/or offset the Klamath River TMDL wasteload allocations and targets.

Timeline

- As specified in the revised NPDES permit.

6.4 Implementation in the Klamath Basin Tributaries and Coordination with Existing TMDLs

The tributaries to the Klamath River include five major tributaries and numerous minor tributaries. The major tributaries are the Trinity, Salmon, Scott, Shasta and Lost Rivers. All the major tributaries, except the Lost River, join the Klamath River in California and are also wholly contained within California. The Lost River traverses the Oregon/ California border three times and ultimately joins the Klamath River in Oregon via the Klamath Straits Drain. The major tributaries each have had technical TMDLs completed that are specific to the tributary basin. The Regional Water Board has adopted TMDL implementation plans for the Shasta, Scott, and Salmon River basins. The Trinity, South Fork Trinity, and Lost River basins have had TMDLs promulgated by the USEPA without associated implementation plans. Table 6.2 provides a summary of completed TMDLs and adopted implementation plans in the major tributaries.

Table 6.2: Completed TMDLs for the major tributaries of the Klamath River basin.

Subwatershed	TMDL(s)	Year	Agency
Lower Lost River	Nutrients and Biochemical Oxygen Demand (BOD)	Final Technical TMDL, 2008	USEPA
Shasta River	Temperature, dissolved oxygen	Final Technical TMDL and Implementation Plan, 2007	Regional Water Board
Scott River	Temperature, sediment	Final Technical TMDL and Implementation Plan, 2006	Regional Water Board
Salmon River	Temperature	Final Technical TMDL and Implementation Plan, 2005	Regional Water Board
Trinity River	Sediment	Final Technical TMDL, 2001	USEPA
South Fork Trinity River	Sediment	Final Technical TMDL, 1998	USEPA

This section discusses the approach to implementation specific to each of the major tributaries given existing TMDLs and implementation plans. The intent of the Klamath implementation plan is to make TMDL requirements as consistent as possible throughout the Klamath River basin while considering existing TMDL implementation plans and ongoing water quality improvements efforts.

6.4.1 *Allocations and Targets*

The Klamath River TMDLs assign nutrient and organic matter load allocations to the mouths of all the major Klamath tributaries in California and 18 specified minor tributaries. The nutrient and organic matter allocations for Klamath River tributaries in California are expressed as monthly mean concentrations, and are presented in section 5.3.4. These allocations are intended primarily to establish boundary conditions and to

prevent any increase of nutrients to the Klamath mainstem. The Shasta River is the only tributary in California that has an existing TMDL with nutrient and organic matter-related allocations. The Klamath River TMDL allocations to the mouth of the Shasta River are consistent with the allocations assigned in the Shasta River TMDLs. Since the Lost River discharges to the Klamath River in Oregon, the allocations are included as part of ODEQ's Klamath River TMDLs and therefore are included in this TMDL through allocations and targets at stateline. Other major tributaries that do not have nutrient TMDLs were set to current conditions.

There are also two temperature-related load allocations and associated targets that apply watershed-wide, i.e. to the Klamath River mainstem and all minor tributaries in California. These allocations and related targets are for excess solar radiation and human-caused discharges of sediment, and are presented in section 5.2.1. Watershed-wide allocations are not assigned to major tributary basins because of their existing allocations that are consistent with the Klamath TMDL.

6.4.2 *Implementation*

This implementation plan proposes a basinwide prohibition on unauthorized discharges of waste that violate water quality standards and the Thermal Refugia Protection Policy as described in section 6.5. However, there are no additional management measures proposed for responsible parties in the tributary basins that already have existing TMDLs except for the USFS, Caltrans, and the Klamath basin County roads. For these parties, staff recommend a regionwide approach and permitting that will provide consistency in regulation throughout the Klamath Basin. The permits should meet the requirements of any existing TMDL implementation plans and should also consider future TMDLs and 303(d) list impairments in the North Coast Region. The following sections outline the existing tributary TMDL requirements and the necessary coordination in implementing the Klamath River TMDLs basinwide. The Lost River implementation plan is presented in section 6.4.3 below. Lost River implementation in California is important because significant load reductions are needed to meet Klamath River water quality standards, and TMDL implementation in this watershed requires coordination with Oregon and federal agencies to meet the allocations at stateline.

6.4.3 *Lost River Implementation Plan*

The USEPA completed a technical TMDL for the Lost River basin in California in December 2008 (USEPA 2008) that included load allocations to meet water quality standards in the Lost River Basin. Implementation measures in the Lost River basin in California are needed to meet the Klamath River TMDL nutrient and organic matter allocations assigned to the Lost River basin at its discharge points to the Klamath River. This staff report includes measures to implement the Lost River TMDL allocations in coordination with the Klamath implementation plan. Significant load reductions are needed to meet Klamath River water quality standards as well as standards in the Lost River basin. Lost River TMDL implementation will be coordinated with Oregon and federal agencies, including the US Bureau of Reclamation (USBR), US Fish and Wildlife Service (USFWS), and the USEPA. In addition to the measures cited here, individual landowners conducting activities associated with nonpoint source discharges, specifically

irrigated agriculture and grazing, will be included in the coverage of the agricultural waiver to be developed by 2012, and are therefore included in section 6.5.6 that includes recommendations and encourages early participation in that process.

6.4.3.1 Background

Historically, the Lost River was only hydrologically connected to the Klamath River in years with extremely high flow. The Lost River was physically linked to the Klamath River when the Lost River basin was engineered to its current configuration in the early 1900s to accommodate the development of the USBR Klamath Irrigation Project (KIP). The KIP diverts water from the Klamath River at three separate locations just downstream of Upper Klamath Lake, and from one location in Upper Klamath Lake. The KIP delivers water to approximately 200,000 acres of farmland as well as four National Wildlife Refuges (Figure 6.2). Of the total acreage of the KIP, approximately 70,000 acres are in California. The Lost River originates in California, enters Oregon, flows through the Klamath Irrigation Project in Oregon and then into the Tule Lake National Wildlife Refuge (TLNWR) in California, the historical terminus of the Lost River. Water from the TLNWR is pumped through a tunnel into the Lower Klamath National Wildlife Refuge (LKNWR) to maintain farmland in the TLNWR, stabilize water levels in the Tule Lake sump, remove salt from the Tule Lake basin, and provide water to LKNWR. Drainage from LKNWR flows back across Oregon through the Klamath Straits Drain (KSD), which discharges into the Klamath River in Oregon. Return flows from the KIP are also discharged seasonally into the Klamath River through the Lost River Diversion Channel (LRDC) in Oregon. Based on the Klamath TMDL analysis, the current loading from the KSD comprises approximately 13 percent of the total phosphorus loading, 23 percent of the total nitrogen loading, and 40 percent of the organic matter loading in the Klamath River at stateline. While on a seasonal basis, the KIP diverts more nutrient and organic matter loads from the Klamath River than it returns to it, the KIP discharges contribute to exceeding the Klamath River water quality standards.

The principal sources of water inflows to the Lost River system in California are agricultural drains that collect irrigation return flows from privately owned agricultural lands within the KIP. The drains and canals are owned by USBR, but are operated by various irrigation districts that hold water delivery contracts with USBR. The KSD and LRDC are owned and operated by USBR, but receive pollutant inputs from upstream agricultural operators. All of Tule Lake and the open water areas of LKNWR are currently part of the National Wildlife Refuge system and are managed by U.S. Fish and Wildlife Service (USFWS). Some refuge lands are jointly managed by USBR for agricultural use.

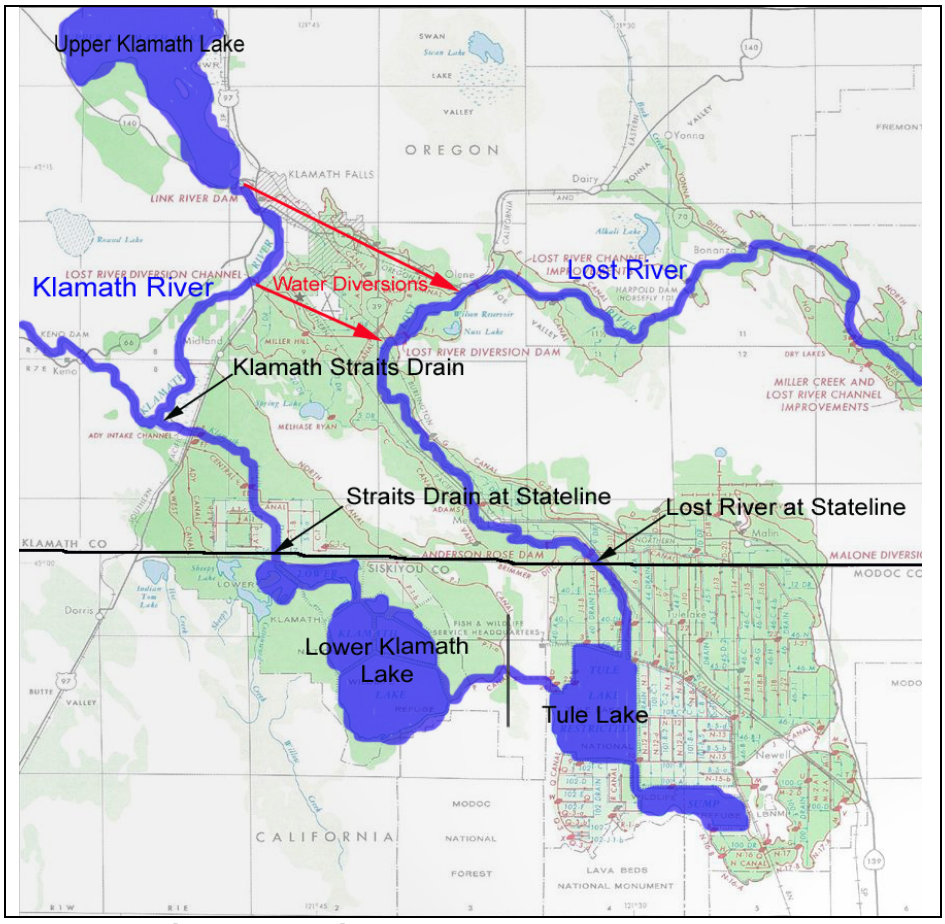

Figure 6.2: The Lost River basin

The load allocations from the USEPA Lost River TMDL in California are shown in Table 6.3.

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Table 6.3: Lost River, California TMDLs and Allocations by Segment.

Segment	Source	Dissolved inorganic nitrogen (DIN) (metric tons/yr)	Dissolved inorganic nitrogen (DIN) (average kg/day)	Carbonaceous biochemical oxygen demand (CBOD) (metric tons/yr)	Carbonaceous biochemical oxygen demand (CBOD) (average kg/day)
1	Lost River at Stateline Road (OR Border) Load Allocation	27.8	76.0	54.3	148.6
	Load Allocation for irrigation drainage loads to Lost River between Stateline Rd and Tule Lake Refuge	1.2	3.2	17.5	47.8
	Wasteload Allocation-CalTrans	0.1	0.3	0.2	0.5
Total	Lost River (from border to Tule Lake Refuge) TMDLs	29.0	79.5	71.9	197.0
2	Upstream load - from Lost River	29.0	79.5	71.9	197.0
	Load Allocation for irrigation drainage loads to Tule Lake Refuge	36.2	99.0	253.3	694.0
	Wasteload Allocation-CalTrans	0.1	0.3	0.2	0.5
	Wasteload Allocation City of Tulelake WWTP	1.0	2.7	3.5	9.6
Total	Tule Lake Refuge TMDLs	66.3	181.5	328.9	901.1
3	Upstream load - from Tule Lake Refuge[a]	19.4	53.2	245.9	673.7
	Load Allocation for irrigation drainage loads to Lower Klamath Refuge	3.9	10.7	39.4	107.8
	Load Allocation to Ady Canal	4.4	12.1	39.4	107.8
	Wasteload Allocation -CalTrans	0.1	0.3	0.2	0.5
Total	Lower Klamath Refuge TMDLs	27.8	76.2	324.8	889.9
4	Upstream load from Lower Klamath Refuge[b]	20.2	55.2	193.3	529.5
	Load Allocation for irrigation drainage loads to Klamath Straits Drain[c]	1.5	4.1	10.5	28.8
Total	Klamath Straits Drain (Stateline Highway to border) TMDLs	21.7	59.3	203.8	558.2

Source: USEPA 2008

[a]Upstream load from Tule Lake Refuge—only a portion of the waters from Tule Lake Refuge are pumped to Lower Klamath Refuge. Additionally, the model assumes that Tule Lake Refuge is a single mixed segment; to avoid transferring uncertainties associated with the coarse spatial resolution to the next downstream segment, monitoring data collected at the D Pumping Plant intake was used as the basis for upstream inputs for this segment.

[b]Because the model assumes that Lower Klamath Refuge is a single mixed segment, water quality inputs to the next segment were based on monitoring data collected at Klamath Straits Drain at Stateline Highway.

[c]In comments on the draft Lost River TMDLs, USBR stated that the portion of the Klamath Straits Drain that exits the Lower Klamath Lake National Wildlife Refuge, and is within California, does not have any agricultural contributions. The table above is taken directly from the Lost River Basin TMDL, in California (USEPA 2008) and has not been altered.

6.4.3.2 Responsible Parties in the Lost River Basin

The parties responsible for implementing water quality control measures that meet the Lost River and Klamath River TMDL allocations in California include:

- US Bureau of Reclamation
- US Fish and Wildlife Service
- Tulelake Irrigation District
- City of Tulelake
- Any party whose activities have the potential to contribute towards the TMDL impairments through the discharge of nutrients or organic material.

6.4.3.3 Implementation

Significant load reductions are needed in the Lost River basin to meet water quality standards in the Lost River basin and to meet the Klamath River TMDL load allocations to Lost River discharges to the Klamath River. Agricultural operators in the Lost River basin in California and Oregon have been implementing water quality control measures for a number of years. For example:

- The NRCS has funded approximately $50 million in projects through the Environmental Quality Incentive Program; a program funded by the US Department of Agriculture (USDA). The funds were split evenly between projects in California and projects in Oregon.
- The Conservation Reserve Program (CRP), also funded by the USDA, pays for conservation easements to establish riparian buffers on agricultural land. In Oregon, this program is expanded and called the Conservation Reserve Enhancement Program to include active restoration of riparian areas.
- Water quality improvement projects have been implemented through the Oregon Water Enhancement Board.
- The Lava Beds/Butte Valley Resource Conservation District (RCD) in Tulelake and the Klamath Soil and Water Conservation District in Oregon have obtained funding through the Agricultural Water Enhancement Program.

Regional Water Board staff support and encourage the continuation of these ongoing programs and coordinating current efforts with TMDL implementation. The implementation measures described in this section apply to dischargers in the Lost River basin in California and, combined with the measures listed below, are sufficient initially to implement the Lost River TMDL in California. The Regional Water Board's proposed basinwide nonpoint source program for agriculture, to be developed separate from this implementation plan (section 6.5.6) will include agricultural dischargers in the Lost River basin. ODEQ is developing the Lost River basin TMDL in Oregon that will include load allocations to the KSD and LRDC that are consistent with the shared technical analysis for the Klamath River TMDL.

6.4.3.4 Proposed Management Agency Agreement

Regional Water Board staff proposes the development of a Management Agency Agreement (MAA) between USBR, USFWS, the Tulelake Irrigation District, and the

Regional Water Board to implement the Lost River and Klamath River TMDLs. The MAA would be a voluntary and cooperative means of implementing the TMDL and would circumvent any dispute as to whether the Regional Water Board can enforce the TMDL load allocations against USBR. The MAA should be completed within six months of Regional Water Board adoption of the Klamath River TMDL Action Plan and include the following actions items:

- Complete a water quality study to characterize the seasonal and annual nutrient and organic matter loading through the KIP and refuges. The study should be completed and inform the development of a water quality management plan to be submitted to the Regional Water Board within 18 months of approval of the Klamath River TMDL Action Plan;
- Based on the results of the water quality study, develop a water quality management plan to meet the Lost River and Klamath River TMDL allocations and targets. The plan should be submitted to the Regional Water Board for approval within 18 months of approval of the Klamath River TMDL Action Plan.
- Include a schedule with interim milestones for meeting the TMDL allocations and targets;
- Coordinate implementation actions with other responsible parties discharging pollutants within the KIP and refuges;
- Develop a monitoring and reporting program with the Regional Water Board to evaluate the effectiveness of management measures and track progress towards meeting TMDL allocations and targets;
- Coordinate with the Klamath River water quality improvement tracking and accounting program in implementing offset projects; and
- Periodically report to the Regional Water Board on actions taken to implement the TMDL and progress towards meeting the TMDL allocations and targets.

6.4.3.5 Coordination with ODEQ and US EPA

As stipulated in the Klamath River and Lost River TMDL Implementation Memorandum of Agreement (MOA) developed by the Regional Water Board, ODEQ and US EPA Regions 9 and 10, the agencies agree to work jointly with common implementation parties, including USBR, USFWS, and the Klamath Water Users Association (KWUA) to develop effective implementation plans and achieve water quality standards. Regional Water Board staff suggest that USBR and USFWS develop the water quality management plan in conjunction with the development of an implementation plan to meet the Klamath River TMDLs in Oregon.

6.4.3.6 Tulelake Wastewater Treatment Plant

The Tulelake Wastewater Treatment Plant (WWTP) is owned and operated by the City of Tulelake and discharges effluent under NPDES Permit No. CA0023272 and WDR No. R1-2004-0075. The waste load allocations to the Tulelake WWTP discharges will be implemented through the federal NPDES permit, which is held by the City of Tulelake. The current permit was as adopted in October 2004, and the treatment plant will continue to operate under the terms of the existing permit until a new permit is issued. The TMDL waste load allocations and targets to the treatment plant discharge will be translated into

effluent limits in the new NPDES permit. The TMDL compliance schedule to accompany the new permit may allow additional time needed for the City of Tulelake to make any infrastructure improvements to the treatment plant and to implement management measures that meet TMDL allocations. The City of Tulelake is assessing the possibility of moving to a land discharge system, in which case, the current NPDES permit would be rescinded, and the discharge would be regulated through WDRs. A land discharge system would meet the TMDL waste load allocations, since there would no longer be a discharge to surface waters from the WWTP.

Implementation Measures in the Lost River Basin

Regional Water Board, USBR, USFWS, and TID:
Measure

- Develop and implement a Management Agency Agreement (MAA) between USBR, USFWS, TID and the Regional Board that addresses the water quality impacts of the Klamath Irrigation Project (KIP). The MAA should include the action items identified above in section 6.4.3.4.

Timeline

- Complete MAA within six months of Regional Water Board adoption of the Klamath River TMDL Action Plan.

Regional Water Board:
Measure

- Revise NPDES Permit No. CA0023272 and WDRs No. R1-2004-0075 to incorporate effluent limits to implement the TMDL wasteload allocations, recalculated site-specific objectives for dissolved oxygen, and require that the responsible party implement measures to improve the water quality of discharges from the Tulelake WWTP to meet TMDL wasteload allocations on a compliance schedule.

Timeline

- December 2010

City of Tulelake:
Measure

- Implement measures to improve the water quality of discharges from the Tulelake WWTP to meet the TMDL wasteload allocations.

Timeline

- As specified in the revised NPDES permit.

6.4.4 *Coordination with the Shasta River TMDL*

The Klamath River TMDL analysis found that the load reductions called for in the Shasta River TMDL are sufficient to meet water quality standards in the Klamath River. The Shasta River TMDL Action Plan includes a goal to increase dedicated instream cold water flows by 45 cubic feet per second (cfs). Attainment of the Klamath River temperature TMDL, and associated temperature standards, requires achieving the Shasta River flow goal. Water made available through the implementation of conservation measures should be dedicated to beneficial use in order to be effective under this Plan. 'Dedicated' means that the diverter, either individually or as a group, can demonstrate

that the measure contains assurances that it will result in water quality benefits. The Regional Water Board staff, with help from the Division of Water Rights, is providing information to assist landowners who want to voluntarily dedicate instream flow. Under Water Code section 1707, any person entitled to use water, whether based on an appropriative, riparian or other water right, may petition the State Water Board to change the purpose of use to the preservation and enhancement of wetlands habitat, fish and wildlife resources, or recreation. The State Water Board may approve the petition if the change does not increase the amount of the original entitlement, does not unreasonably affect any legal user of water, and meets other requirements of the Water Code. These efforts are not a requirement of the Klamath TMDL and are provided here for informational purposes only.

The Shasta River TMDL Action Plan includes a conditional waiver of WDRs for parties discharging to the Shasta River basin as long as they comply with the Action Plan measures. The agricultural conditional waiver of WDRs proposed for development as part of a future stakeholder process (see section 6.5.6) may eventually supersede the Shasta River basin conditional waiver when they are adopted. The Regional Water Board will assess the effectiveness of the Shasta River TMDL waiver when it expires. At that time, the Regional Water Board will decide whether to extend the Shasta TMDL waiver, revise and reissue the Shasta TMDL waiver, or incorporate it into the proposed regionwide conditional waiver developed for nonpoint source discharges from agricultural activities. In the meantime, compliance with the Shasta River waiver is sufficient to meet the requirements of the Klamath River TMDL.

6.4.5 *Coordination with the Scott River TMDL*

The Scott River TMDL Action Plan includes sediment and temperature control measures, and it is anticipated that these measures are sufficient to meet the Klamath River TMDL watershed-wide temperature allocations and targets and are consistent with the proposed prohibition on the discharge of excess sediment. The Scott River TMDL recommended that the County of Siskiyou, in cooperation with other appropriate stakeholders, develop a plan for a study of the connection between groundwater and surface water in the Scott Valley. This study plan has been completed. The Regional Water Board has provided funds to implement the initial phases of the plan. This plan should move forward in order to help assist Scott water users to develop appropriate management practices that can be implemented following the study in order to ensure adequate flow in the Scott River. This is not a requirement of the Klamath TMDL and is provided here for informational purposes only.

The Klamath River TMDL assigns nutrient and organic matter allocations to the Scott River, and the Scott River Action Plan does not include measures to control discharges of these pollutants. The Regional Water Board will assess the effectiveness of the Scott River TMDL waiver when it expires. At that time, the Regional Water Board will decide whether to extend Scott TMDL waiver, revise and reissue the Scott TMDL waiver, or incorporate it into the proposed regionwide conditional waiver for nonpoint source discharges from agricultural activities. The need for nutrient control measures will be addressed as part of that determination.

6.4.6 *Coordination with the Salmon River TMDL*

The USFS manages 97% of the land in the Salmon River basin, and the Regional Water Board passed a resolution in 2005 to develop an MOU with the USFS that would implement the Salmon River TMDL. The MOU was signed in September 2009. As discussed in section 6.6 (Implementation on Federally Managed Lands) Regional Water Board staff are in the process of developing a conditional waiver of WDRs to address USFS nonpoint source discharges in the Region, including the Salmon River basin. This waiver would incorporate the implementation measures agreed upon in the MOU and would also require compliance with the Klamath TMDL allocations and targets.

6.4.7 *Trinity River Implementation*

6.4.7.1 Responsible Parties

The Bureau of Reclamation is identified here as the party responsible for implementing the Trinity River Restoration Project as described below.

6.4.7.2 Implementation

The USEPA completed sediment TMDLs for the South Fork Trinity River in 1998 and for the mainstem Trinity River in 2001. These USEPA promulgated TMDLs do not currently include implementation plans. This Klamath implementation plan includes measures that serve as early implementation of those TMDLs and will also address the temperature impairment on the South Fork Trinity River. The Trinity River is also assigned nutrient and organic matter allocations in the Klamath River TMDL that are consistent with current conditions.

The primary adverse impacts associated with excessive sediment in the Trinity River pertain to anadromous salmonid fish habitat, which the Trinity River Restoration Program (TRRP) was designed to correct. The TRRP is a management program, headed by the Department of the Interior, to restore the fish and wildlife populations in the Trinity River basin to levels that existed prior to construction of the Trinity and Lewiston dams. The EPA cites implementation of the TRRP 2000 Record of Decision (ROD), including flow regime, mainstem/watershed restoration, and adaptive management, in its TMDL implementation recommendations. The Regional Water Board is in the process of developing a general permit for the restoration component of the ROD and considers its proposed permitting action on TRRP measures to be early TMDL implementation of the Trinity TMDL.

The Klamath River TMDL analysis used flows for the Trinity River that were specified in the ROD and signed by the US Secretary of the Interior and the Hoopa Valley Tribal Chairman. The TMDL analysis found that these flows are necessary to meet water quality objectives for water temperature in the mainstem Klamath River. Implementation of the TRRP, including the ROD, has been added to the Basin Plan Amendment language.

Implementation Measures in the Trinity River Basin

Regional Water Board:
Measure
- Develop general Waste Discharge Requirements/401 water quality certification for TRRP mechanical restoration.

Timeline
- 2010

USBR:
Measure
- Implement Trinity River Restoration Plan Record of Decision

Timeline
- Ongoing

6.5 Nonpoint Source Control and the Watershed-Wide Allocations

This section presents the proposed TMDL implementation measures assigned to responsible parties that are discharging nonpoint sources of waste in the Klamath Basin. The following land uses were identified as the primary nonpoint sources of pollution in the Klamath River basin that contribute to the water quality impairments:

- Road construction and maintenance;
- Agriculture including grazing and irrigated agriculture;
- Timber harvest; and
- Land use activities on land managed by the USFS.

This section summarizes the watershed-wide allocations and targets for temperature, introduces a proposed prohibition on unauthorized discharges that violate water quality standards, provides guidance on control of excess sediment discharges, and introduces the Thermal Refugia Protection Policy. It then presents the implementation measures associated with the above named land use categories. For each of the land use activities, Regional Water Board staff evaluate the effectiveness of current regulatory programs and strategies as well as other regulatory and non-regulatory water quality protection efforts. Staff then make recommendations for implementation measures as needed to ensure the Klamath TMDLs and measures are coordinated within the context of the Regional Water Board's regionwide nonpoint source planning approach. Ultimately it is the Regional Water Board's goal to combine as many discharge requirements for various land use activities as comprehensively as possible into one permitting structure.

Changes from the June 2009 draft

The Regional Water Board staff have made the following changes to this section of the draft implementation plan in response to comments received during the public comment period for the previously released June 2009 draft:

1. Proposal of a Basin Plan amendment: Prohibition on Unauthorized Discharges of Waste that Cause a Violation of Water Quality Standards. (section 6.5.2)
2. Removal of the proposed sediment prohibition and the proposal of Guidance for the Control of Excess Sediment. (section 6.5.3)
3. Restructuring of the prohibition on the discharge of waste in and around thermal refugia in the Klamath Basin and the proposal of a Thermal Refugia Protection Policy for the Klamath Basin to be included in the Action Plan. (Section 6.5.4)
4. Changes to the implementation measures for the USFS to incorporate the current development of a conditional waiver for certain nonpoint source activities on lands managed by the USFS. The waiver is scheduled for Regional Water Board adoption in April 2010. (section 6.6)

These changes are discussed in the sections indicated above. Other smaller changes have also been made, including a discussion on how TMDL requirements for maintenance of riparian shade relate to the Anadromous Salmonid Protection Rules for timber harvest, recently adopted by the California Board of Forestry section 6.5.7.6.

6.5.1 *Watershed-wide Allocations and Targets for Water Temperature*

The following watershed-wide allocations and targets apply only to the Klamath River mainstem and minor tributaries.

6.5.1.1 Riparian Shade Allocations and Targets

The Klamath River TMDL assigns allocations and targets for riparian shade to limit water temperature increases due to solar radiation (section 5.2.1). Land use activities in the Klamath River basin have the potential to degrade riparian conditions, and all parties are responsible for meeting the same riparian shade allocation. The following discussion is intended to clarify implementation of the riparian shade allocation and provide the basis for the implementation recommendations specific to each land use.

The riparian shade allocation requires the maintenance of the following *shade conditions*:

> the shade provided by topography and full potential vegetation conditions at a site, with an allowance for natural disturbances such as floods, wind throw, disease, landslides, and fire.

The allocation allows for site-specific determination of shade potential, recognizing that potential varies by location. Shade conditions can be equated to the *effective shade* to the waterbody. Effective shade is defined as:

> a measure of the percentage of total daily direct beam solar radiation that is blocked by vegetation or topography before reaching the ground or stream surface, taking into account the differences in solar intensity that occur throughout a day.

The process for assessing compliance with the Klamath River TMDL riparian shade allocation begins by comparing the current effective shade and the site potential effective

shade. The site potential effective shade is designated as the riparian shade target in the TMDL. The TMDL provides general targets for effective shade based on the shade percentages that are expected to naturally occur for a given type of vegetation, aspect, and stream width. The effective shade curves in Figures 5.4 – 5.9, found in Chapter 5 of this staff report, represent the numeric targets for riparian shade within the Klamath River basin in California. The targets are intended as a guide for riparian management, and may be modified based on site-specific conditions.

In simple terms, compliance with the shade allocation is achieved by not removing trees that provide shade to the waterbody. To accomplish this, it is recommended that responsible parties delineate a separate management area for riparian vegetation that has the potential to shade a waterbody, and manage these riparian areas differently than the surrounding land. These areas are referred to variously as a riparian management zone, streamside buffer area, or a watershed and lake protection zone. The riparian management area should be large enough to include any trees that have the potential to provide shade to surface waters once they reach their site potential height. In most cases, the landowner will not be required to actively restore riparian conditions by planting trees in order to comply with the TMDL. However, active restoration of riparian conditions may be appropriate in instances where riparian vegetation has been removed and causes violation of the Basin Plan temperature standards and the Klamath River shade allocations and targets, or where natural vegetation is not readily becoming reestablished on its own. Regional Water Board staff acknowledge that it may be necessary in some cases to remove some riparian vegetation to hasten recovery towards site potential effective shade conditions.

6.5.1.2 Sediment Related Water Temperature Allocation and Targets

The TMDL found that sediment discharges in the Klamath River basin have a potential cumulative impact on water temperatures through the alteration of channel structure, particularly in the tributary basins. To control the impacts of excess sediment on water temperature, the Klamath River TMDL assigns the following temperature-related load allocation for human-caused discharges of sediment (section 5.2.1.2):

> Zero temperature increase caused by substantial human-caused sediment-related channel alteration.

Substantial human-caused sediment-related channel alteration is defined as:

> A human-caused alteration of stream channel dimensions that increases channel width, decreases depth, or removes riparian vegetation to a degree that alters stream temperature dynamics and is caused by increased sediment loading.

The TMDL also identifies three targets related to the impacts of excess sediment:

1. 0 miles of substantial human-caused sediment-related channel alteration.
2. Less than 1% of all stream crossings divert or fail as a result of a 100-year or smaller flood.

3. Decreasing number of potential road-related landslide source areas. .

6.5.2 *Prohibition of Discharges in Violation of Water Quality Objectives in the Klamath River Basin*

In response to numerous comments received, staff have removed any interim requirements on individual landowners and operators to control discharges associated with irrigated agriculture and grazing activities and sediment discharges in lieu of incorporating TMDL implementation into basin and/or region wide nonpoint source programs for efficiency and consistency. The following prohibition against unauthorized discharges of waste that violate water quality standards is proposed to protect against serious and significant individual threats to water quality. This prohibition is a restatement of existing law and is not intended to provide a nonpoint source program that implements measures to control the cumulative impact of individual nonpoint source discharges of waste from agricultural activities. Individuals who are concerned about any discharges that violate water quality standards should contact the Regional Water Board and inquire about obtaining an individual permit.

Discharges of waste that violate any narrative or numerical water quality objectives that are not authorized by waste discharge requirements or other order or action by the regional or state water board, are prohibited

6.5.3 *Guidance on the Control of Excess Sediment*

To help achieve the watershed-wide TMDL allocations and targets, the implementation plan provides guidance for the control of excess sediment. This guidance is suggestive only and in no way limits the enforcement authority of the Regional Water Board under applicable law.

Parties conducting land use activities that have the potential to discharge sediment should implement the following sequential measures:

1. Prevent – Plan, design, and implement the project or activity in such a way that no excess sediment discharge occurs or could occur to waters of the state.
2. Minimize – If the discharge or threatened discharge of excess sediment cannot be fully prevented, then plan, design, and implement the project in such a way that discharges to waters of the state are minimized to the maximum extent possible.

Parties responsible for existing sediment sources (including human-caused legacy sources) should implement the following measures:

1. Inventory: Identify sources of excess sediment discharge or threatened discharge and quantify the discharge or threatened discharge from the sources.
2. Prioritize: Prioritize efforts to control the inventoried sediment sources based on, but not limited to, severity of threat to water quality and beneficial uses, the feasibility of source control, and source site accessibility.
3. Schedule: Develop a schedule to implement the cleanup of controllable sediment discharge sites.

4. Implement: Develop and implement feasible sediment control practices to prevent, minimize, and control the discharge.
5. Monitor and Adapt: Use monitoring results to direct adaptive management in order to refine excess sediment control practices and implementation schedules until discharges are reduced to a level that meets the TMDL load allocations and water quality standards.

6.5.4 *Thermal Refugia Protection Policy*

The Thermal Refugia Protection Policy proposed by the Klamath implementation plan intends to provide enhanced protection of cold water refugia along the mainstem Klamath River and in the lower Scott River. Thermal refugia are typically identified as areas of cool water created by inflowing tributaries, springs, seeps or through upwelling hyporheic flow, and groundwater in an otherwise warm stream channel offering refuge habitat to cold-water fish and other cold water aquatic species. The refugia created by some tributaries in the Klamath River basin are typically in the plumes and pools of cold water that form in the mainstem at the tributary confluence. Refugia also exist in some tributary streams themselves. Thermal refugia in the Klamath River basin are essential to the support of the cold water fishery because they moderate the impact of naturally elevated temperatures in the mainstem Klamath River and also can provide a refuge from depressed mainstem dissolved oxygen levels. Their protection has become even more important since the Klamath River has become impaired for temperature. The implementation plan focuses on protecting the critical function of thermal refugia in moderating mainstem Klamath River temperatures in the mid-to later-summer months.

The elements of the Thermal Refugia Protection Policy are:

1. The identification of known thermal refugia locations in the Klamath basin where the policy would apply.
2. The designation of an instream buffer area surrounding thermal refugia where discharges of waste would be restricted unless otherwise permitted by the Regional Water Board.
3. A recommendation to the State Water Resources Control Board and the California Department of Fish and Game to exclude suction dredging activities from the designated instream buffer areas in their respective permits.
4. Heightened scrutiny in Regional Board permitting and water quality certification of activities that have the potential to impact the function of thermal refugia.
5. A recommendation to the State Water Board to consider the impact of increased diversions in tributaries that provide thermal refugia when issuing water rights permits to divert surface water or other water rights actions in the Klamath River basin in California.
6. Recommendation to large landowners in the Klamath basin to prioritize restoration and water quality control efforts in tributary watersheds that provide thermal refugia.

6.5.4.1 Identification of Thermal Refugia in the Klamath River Basin in California

The shape and extent of refugia are highly variable and are dependent on stream geomorphology, riparian canopy, sediment dynamics, and flow. Regional Water Board staff recognize that there are a number of factors that can cause seasonal and inter-annual changes in the existence, location, and size of the thermal refugia in the basin. Taken as a whole, these thermal refugia comprise a network of support for populations of cold water fishes in the Klamath River basin.

In order to identify the locations of known thermal refugia in the basin, Regional Water Board staff solicited information from fisheries biologists working in the Klamath River basin through a formal request in April 2009. Based on the information staff received, as well as review of the available reports on the topic, staff compiled a list of the known thermal refugia in the Klamath River basin in California (Table 6.4). References consulted to compile the list of tributaries include the following and will be included in the administrative record of the Klamath TMDL:

1. Grunbaum, Jon B. Memo of Recommended Suction Dredging Guidelines for the Happy Camp Ranger District of Klamath National Forest. 2005.

2. Superior Court of California, County of Alemeda, Hayward Division. Case No.: RG 05 211597. Declaration of Peter B. Moyle, Ph. D., in Support of Entry of Stipulated Judgment. January 26, 2006.

3. Belchik, Michael. Use of Thermal Refugial Areas on the Klamath River by Juvenile Salmonids; Summer 1998. Yurok Tribal Fisheries Program. November, 2003.

4. Belchik, Michael. Summer Locations and Salmonid Use of Cool Water Areas in the Klamath River. Yurok Tribal Fisheries Program. August 1997.

Letters and emails were received from the following persons in response to the April 2009 request:

- Mark Stopher of the California Department of Fish and Game, April 15, 2009.
- Mike Belchick of the Yurok Tribal Fisheries Program, April 24, 2009.
- Earl Crosby of the Karuk Tribe, April 30, 2009.
- Will Harling, Executive Director of the Mid-Klamath Watershed Council, April 28, 2009.
- Jon Grunbaum, Fisheries Biologist for the Klamath National Forest, May 1, 2009.

Maps showing the locations of these creeks in the Klamath River basin are provide in Appendix 9.

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Table 6.4: Tributaries to the Klamath River Known to Provide Thermal Refugia In and Around Their Confluence.

Tributaries		
Aikens Creek	Halverson Creek	Pine Creek
Aubrey Creek	Hopkins Creek	Portuguese Creek
Barkhouse Creek	Horse Creek	Red Cap Creek
Beaver Creek	Humbug Creek	Reynolds Creek
Blue Creek	Hunter Creek	Roach Creek
Bluff Creek	Ikes Creek	Rock Creek
Bogus Creek	Independence Creek	Rogers Creek
Boise Creek	Indian Creek	Rosaleno Creek
Boulder Creek[1]	Irving Creek	Sandy Bar Creek
Cade Creek	Kelsey Creek[1]	Salt Creek
Camp Creek	King Creek	Seiad Creek
Canyon Creek[1]	Kohl Creek	Slate Creek
Cappell Creek	Kuntz Creek	Stanshaw Creek
Cheenitch Creek	Ladds Creek	Swillup Creek
China Creek	Little Horse Creek	Ten Eyck Creek
Clear Creek	Little Humbug Creek	Thompson Creek
Coon Creek	Little Grider Creek	Thomas Creek
Crawford Creek (Humboldt Co.)	Lumgrey Creek	Ti Creek
Crawford Creek (Siskiyou Co.)	McGarvey Creek	Titus Creek
Dillon Creek	Mill Creek	Tom Martin Creek
Doggett Creek	Miners Creek	Trinity River
Dona Creek	McKinney Creek	Tully Creek
Donahue Flat Creek	Nantucket Creek	Ukonom Creek
Elk Creek	Negro Creek	Ullathorne Creek
Elliot Creek	Oak Flat Creek	Walker Creek
Empire Creek	O'Neil Creek	West Grider Creek
Fort Goff Creek	Pecwan Creek	Whitmore Creek
Grider Creek	Pearch Creek	Wilson Creek

[1] Scott River tributary

6.5.4.2 Designation of the Instream Buffer Areas

Instream buffer areas are located in and around the mouths of the tributaries that create refugia in the mainstem Klamath River. Two buffer areas are recommended within the wetted channel of the Klamath River; one upstream and one downstream of the tributary confluence providing thermal refugia. A third buffer area is recommended in the wetted channel of the tributary stream providing thermal refugia, located upstream of the tributary confluence with the Klamath River. These three buffer areas are assigned different lengths based on the potential impacts of instream activities such as suction dredging within that area. Figure 6.3 shows a generic tributary/river confluence with the different instream buffer areas delineated.

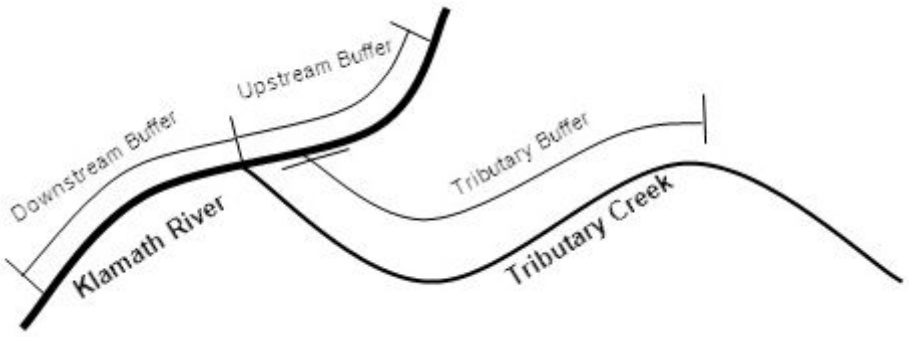

Figure 6.3: Conceptual diagram of proposed buffers in and around the confluence of a tributary providing thermal refugia.

Regional Water Board staff recommend a default buffer where no site-specific information is available regarding the spatial extent of the refugia. Where site-specific information is available, an extended buffer may be recommended. Regional Water Board staff referenced a thermal infrared study of the Klamath River basin conducted in August 2003 to identify creeks where a more extensive buffer is appropriate (Watershed Sciences 2004). The study showed the spatial dimensions and water temperatures of cold-water refugia in the mainstem Klamath River. Staff also considered information submitted in response to the April 2009 solicitation.

The buffer length that extends downstream of the tributary confluence is sized to protect cold water plumes that form in the Klamath River where tributaries enter the mainstem river. Most thermal refugia formed by cold water plumes are located within 300 feet of the tributary confluence. Adding a margin of safety to this distance, staff recommend an instream buffer of 500 feet from the tributary confluence in the downstream direction. The responses Regional Water Board staff received from the April 2009 solicitation identified a number of refugia locations where a buffer of 500 feet would not be sufficient to protect the refugia from impacts of instream activities such as suction dredging. For these refugia, staff are recommending a 1500 foot buffer. The tributaries where a 1500 foot buffer is recommended include: Aubrey, Beaver, Clear, Dillon, Elk Creek, Grider, Horse, Indian, Rock, Swillup, Thompson, and Ukonom (See Appendix 9 for a map showing locations).

To protect the refugia from activities upstream of the tributary confluence, the buffer needs to be large enough so that instream activities such as suction dredging have a negligible impact on the function of the refugia downstream. Suction dredging can create plumes of sediment that usually settle out downstream within 300 ft. Adding a margin of safety to this distance, Regional Water Board staff recommend a buffer area of 500 feet where discharges from suction dredging would be prohibited in the Klamath River upstream of tributary confluences where known refugia exist.

The portion of the tributary that is just upstream of the tributary mouth can function either as a water supply for the cold water plume in the mainstem, or it can function as a thermal refuge itself. The functions provided by the tributary depend partially on

whether fish have physical access to that tributary. If the tributary itself is the refugia, the buffer should extend at least as far as the thermal refuge area within the tributary. To protect the tributaries that provide cold water refugia, staff recommend a prohibition on discharges from suction dredging activities within the lower 500 feet of the tributary. As with the buffer extent in the downstream direction in the Klamath River, the fisheries biologists that responded to the April 2009 solicitation identified a number of tributaries known to provide refugia for fish. To protect these tributaries from the potential impacts of instream activities it is recommended that the buffer be extended to 3000 feet within the tributary upstream of its confluence with the mainstem river. The following is a list of tributary creeks that Regional Water Board staff recommend be provided this added protection: Aubrey, Beaver, Clear, Dillon, Elk Creek, Empire, Fort Goff, Grider, Horse, Indian, King, Little Horse, Little Humbug, Mill, Nantucket, O'Neil, Portuguese, Reynolds, Rock, Sandy Bar, Seiad, Stanshaw, Swillup, Thompson, Ti and Titus (See Appendix 9 for a map showing locations).

6.5.4.3 Changes to List of Thermal Refugia Locations and Designated Buffer Lengths
Staff recommend that the list of identified thermal refugia in the Klamath basin and the designated buffer length be updated as new information becomes available. This should be done through a public process. Persons proposing modification to the list should submit supporting evidence to the Executive Officer. The Executive Officer may add or remove thermal refugia and/or buffer length designations after public notice and opportunity for public comment. The current list and maps showing the locations will be maintained on the Regional Water Board website at www.waterboards.ca.gov/northcoast.

6.5.4.4 Discharge Restriction In Designated Instream Buffer Areas
The implementation plan recommends restricting parties conducting activities in the Klamath Basin from discharging waste within the designated instream buffer areas described above. This provision was developed primarily to address the potential of suction dredging activities to impact the function of thermal refugia in the Klamath basin, since discharges associated with suction dredging are currently unregulated by the Regional Water Board. The restriction would apply June 15 – September 15 when thermal refugia are typically functioning in the mainstem Klamath River. It would not apply to other activities where discharges are already regulated by a separate regulatory mechanism such as WDRs, waiver(s) of WDRs, and/or a 401 water quality certification.

6.5.4.5 Status of Suction Dredging as a Point or Nonpoint Source
The status of a discharge from a suction dredge as a point or nonpoint source is currently undefined in California, but other states have designated it a point source and developed NPDES permits to address these discharges. Should suction dredging discharges be found to be point sources in California, they would be prohibited from discharging in the Klamath Basin by an existing general prohibition against all point source discharges in the Basin Plan (Basin Plan at 4-1.00). The State of California would also be obliged to develop an NPDES permit for suction dredging to regulate it as a point source. To accommodate this scenario, the Regional Water Board staff propose that the Basin Plan prohibition on point source discharges only apply to discharges associated with suction

dredging activities within the buffer areas designated in the Thermal Refugia Protection Policy. Suction dredging outside of these areas would be permitted by an NPDES permit.

6.5.4.6 SB 670 and the CA Department of Fish and Game Suction Dredging Permit

The California Department of Fish and Game (CDFG) had been administering a permit for suction dredging activities in the Klamath River basin up until May 2009 when the State Senate passed a bill (SB 670) requiring the CDFG to temporarily halt issuance of all suction dredge mining permits. Senate Bill 670 prohibits the use of suction dredge mining equipment in rivers and streams that provide critical habitat to spawning salmon and steelhead until the CDFG updates its suction dredge rules so they comply with CEQA. Pursuant to SB 670, the California Department of Fish and Game is in the process of developing a Fish and Game permit for suction dredging activities in California with input from the State Water Resources Control Board. The Klamath River TMDL implementation plan supports this process as the means to address the impacts of suction dredging activities, and Regional Water Board staff recommend that CDFG be directed in the Basin Plan to incorporate the Thermal Refugia Protection Policy into the revised permit. In the event that the State Water Board issues a state-wide permit for suction dredging, Regional Water Board staff recommend that the Thermal Refugia Protection Policy be incorporated into the revised permit. This directive in no way limits either permitting agency from implementing more stringent requirements.

6.5.4.7 Tributary Flows

Maintaining near natural flows in the Klamath River tributaries in California is an important component of meeting the Basin Plan water temperature objective. In particular, cold water flows are necessary to maintain the function of thermal refugia in the Klamath River basin. Regional Water Board staff will work with other state and federal agencies and tribes to identify and address illegal diversions in the Klamath River basin in California. In addition, Regional Water Board staff recommend that the State Water Board, in administering water rights permits to divert surface water and other actions in the Klamath River basin in California consider the impact of increased diversions on tributaries that provide thermal refugia.

6.5.5 *Road Construction and Maintenance on Nonfederal Lands*

The road networks in the Klamath River basin contribute to elevated temperatures in tributary watersheds through the discharge of excess sediment. The implementation plan includes measures for parties responsible for construction and maintenance of roads in the Klamath River basin to meet the road-related TMDL allocations and targets. The road-related TMDL targets (section 6.5.1.2) are measurable and will be used to track the progress of implementation in the basin.

6.5.5.1 Responsible Parties

- All parties responsible for the construction and maintenance of roads
- Modoc, Del Norte, Humboldt, Siskiyou, and Trinity Counties
- California Department of Transportation (Caltrans)

6.5.5.2 Existing Regulatory Structure

The Regional Water Board currently has the following regulatory mechanisms in place:

- Discharges from roads associated with a timber harvest plan (THP) or NTMP are regulated through the Regional Water Board's existing WDRs and waivers of WDRs as described in Section 6.5.7. Existing plans used to meet the TMDL requirements may need to be updated so they meet the applicable watershed-wide allocations and targets.
- Discharges from roads related to logging or construction are subject to discharge prohibitions in the Basin Plan.
- Discharges from state highways managed by Caltrans are regulated through a statewide NPDES permit.
- Any road construction over one acre must enroll in the state-wide construction stormwater permit, which functions similarly to a nonpoint source permit by requiring BMPs and other management measures designed to reduce runoff and erosion. The State Water Board has recently adopted an updated construction permit.
- A water quality certification pursuant to section 401 of the Clean Water Act must be obtained from the Regional Water Board by anyone proposing to conduct a project that requires a federal permit. The most common trigger for a 401 water quality certification is the federal Section 404 US Army Corp of Engineers permit that is required of anyone who proposes an activity that would discharge dredged or fill material into waters of the United States. The 404 permit applies to roads in the Klamath River basin not associated with silviculture or agriculture, which are specifically exempted. All other road construction and/or maintenance projects in and around stream channels in the Klamath River basin are required to apply for this 404 permit. Regional Water Board staff routinely require water quality protection measures in certifying these types of projects.

The construction of roads that involves less than one acre of land disturbance, as well as routine maintenance of existing roads, including county roads, roads associated with grazing and irrigated agriculture, and rural residential roads in the Klamath River basin, are currently not regulated by the Regional Water Board.

6.5.5.3 Implementation to Address Road-Related Discharges on Private Lands

Most roads located on private lands in the Klamath River basin are associated with timberland ownerships, however roads associated with other land uses, such as agriculture, also exist as do a significant number of rural residential roads. Measures to address road-related discharges will also be incorporated into any land use specific WDRs and waivers proposed as part of this implementation plan such as those proposed for grazing activities and irrigated agriculture. Regional Water Board staff encourage the larger landowners in the Klamath River basin that are responsible for maintaining a significant road network on their land to work with staff to develop ownership-wide WDRs that meet the TMDL requirements on a programmatic level. One of the benefits of ownership-wide WDRs is that they may be developed with input from regulated

entities to consider site-specific conditions within the ownership and existing road management plans.

Following are three excellent references on constructing and maintaining forest and ranch roads that can be used to select management practices to comply with the TMDL.

1. National Management Measures to Control Nonpoint Source Pollution from Forestry, US EPA, 2005. (see road sections within) http://www.epa.gov/owow/nps/forestrymgmt

2. Handbook for Forest and Ranch Roads, Weaver and Hagans, 1994. http://www.krisweb.com/biblio/gen_mcrcd_weaveretal_1994_handbook.pdf

3. Environmentally Sensitive Maintenance for Dirt and Gravel Roads, compiled for US EPA, 2005. http://www.epa.gov/owow/nps/sensitive/sensitive.html

If you do not have access to the internet, call the Regional Board at 707-576-6750 to obtain a hardcopy of any of these documents.

6.5.5.4 Existing Management Plans and Programs

Parties managing roads in the Klamath Basin may have already developed property-wide plans that include management measures to control nonpoint source pollution. Roads are often a major component of these plans, since they have significant potential to impact water quality. Implementation of existing plans and programs may be used to fulfill the requirements of the TMDL. For example, industrial timber companies may be implementing a Habitat Conservation Plan (HCP) as part of their Endangered Species Act compliance. Another existing management plan that may be used in part to comply with the TMDL is the Non-Industrial Timber Management Plan (NTMP). NTMPs are developed by individual landowners under 2,500 acres to comply with the Forest Practice Rules and must include water quality protection measures for roads. It is the responsibility of the landowner to ensure existing plans and programs achieve TMDL allocations and that additional measures are implemented as needed for compliance. Regional Board staff are available to work with landowners to implement the Klamath TMDLs and revise existing programs accordingly.

Green Diamond WDRs

The Regional Water Board staff are currently in the process of developing WDRs for Green Diamond Resource Company (Green Diamond) to address potential discharges associated with road-related maintenance and management activities as part of their Aquatic HCP. The WDRs are scheduled for adoption by the Regional Water Board by April 2010. These WDRs will incorporate implementation measures to meet the Klamath River TMDLs. By complying with the WDRs in the Klamath basin, Green Diamond will be in compliance with the Klamath TMDL requirements for road-related discharges.

Green Diamond's HCP establishes a solid framework for TMDL compliance because it contains stringent water quality protections implemented across their landownership. For example, the HCP requires watershed assessments of road-related sediment sources,

prioritization of those sources, and implementation of appropriate management practices to upgrade or decommission roads according to the assessment. The monitoring included in the HCP can also comply with the Klamath TMDLs because the HCP and the TMDL both track implementation of management practices that control pollution as well as progress towards meeting instream water quality objectives.

Following are some of the examples of management measures summarized from the Green Diamond HCP (2006) relevant to TMDL implementation for controlling impacts from roads:

Slope Stability

- Establishes a system for identifying slope stability management zones (SMZ) where steep slopes lead to Class I and II waters.
- Road construction is prohibited in the SMZ without approved review and harvest is limited

Road Management

- Conduct assessments in 58 sub-watershed road work units (RWUs) to identify sediment source sites
- Provides $2.5 million a year for 15 years for treating high and moderate priority sites
- Road use is seasonally restricted and prohibited if sediment delivery is identified
- All new culverts must meet 100-year return interval flow design standard and existing culverts must be within 15% of the design flow to not be replaced
- Conduct emergency inspections of all accessible rocked roads if a storm produces 3 or more inches of rain in a 24-hour period, and prioritize repairs

Monitoring

- Monitor road-related delivery of fine sediment and evaluation of the effectiveness of road management measures

Regional Board staff will work with Green Diamond to integrate the HCP with the WDRs and TMDL implementation.

6.5.5.5 Implementation Measures to Address County Roads

Del Norte, Humboldt, Modoc, Siskiyou, and Trinity Counties are responsible for maintaining county roads and meeting water quality standards. The potential for roads to discharge sediment in amounts that can cause alteration to stream channels is documented in the technical TMDL source analysis (Chapter 4). The Regional Water Board does not currently regulate discharges associated with county roads and plans to develop a regulatory approach in compliance with the State NPS Policy. The approach recommended by the Klamath implementation plan is to certify the Five County Roads Program (5C Program) that includes all counties in the Klamath Basin except Modoc County. Discharges from Modoc County will be addressed through the Regional Board's Basin Plan prohibitions.

Pursuant to the Impaired Waters Policy, Regional Water Boards may rely upon the 5C program to implement the TMDL if it can determine the following:

- the implementing program is consistent with the assumptions and requirements of the TMDL;
- sufficient mechanisms exist to provide reasonable assurances that the program will address the impairment in a reasonable period of time; and
- sufficient mechanisms exist to ensure that the program will be enforced, or that the Regional Water Board has sufficient confidence that the program will be implemented such that further regulatory action would be unnecessary and redundant.

Five Counties Salmonid Conservation Program

Five counties in the North Coast Region, four of which are in the Klamath River basin, have already initiated a unified program that addresses sediment discharges on county roads. In 1997, the Counties of Del Norte, Humboldt, Mendocino, Siskiyou, and Trinity agreed to form the Five Counties Salmonid Conservation Program (5C Program) in response to federal Endangered Species Act listings of salmon species as 'Threatened'. The program objectives include: "identify(ing) potential problem sites through systematic inventories of fish passage barriers and potential erosion sources on County maintained roads (Five Counties Salmonid Conservation Program 2009)." The 5C Program includes inventorying road-related sediment sources and implementing management practices to address those sources. The program has made considerable progress, and as of 2007, more than 2113 miles of county roads have been inventoried within the five counties. In consultation with state and federal agencies, the 5C Program has also developed *A Water Quality and Stream Habitat Protection Manual for County Road Maintenance in Northwestern California Watersheds* (5C Manual, Five Counties Salmonid Conservation Program 2002). The 5C Manual prescribes management practices for both routine and emergency repair and maintenance of county roads, bridges and related facilities.
The 5C Manual contains a protocol for developing County Road Sediment Source Inventories of portions of county roads in order to set priority locations for erosion and sediment control efforts. The resulting Direct Inventory of Roads and Treatments (DIRT) provides a useful database for the counties' road departments to track progress in treating priority sites and associated sediment savings. The 5C Manual includes implementation and effectiveness monitoring and requires an annual report that summarizes the counties' self-evaluation of the effectiveness of road maintenance BMPs in protecting water quality and stream habitat.

Recommendation

The Regional Water Board staff recommend certifying the 5C Program because it contains measures adequate to meet the TMDL allocations and water quality standards. The certification will require a monitoring plan, and conditions that require trackable progress. The program's success will be assessed by the Regional Water Board every five years and the certification may be revoked if the program is found to be not adequately implemented, not achieving its goals, or is no longer adequate to restore water quality. To receive coverage under the waiver and certified 5C Program, each county must certify its intent to comply with the 5C program or otherwise indicate its intention to participate. This can be accomplished by acceptance and implementation of the 5C

Manual by the County Board of Supervisors as a CEQA-exempt project, or other evidence of intent such as an agreement with the Director of Public Works or County Road Department to abide by the practices in the 5C Manual. The certification and waiver will not cover activities that otherwise require coverage under a different permit including the state-wide construction stormwater permit for new construction, or projects that require water quality certification under section 401 of the Clean Water Act. In the alternative, a county may submit a report of waste discharge and the Regional Water Board will process a WDR for county roads. This may be an option for Modoc County, which is not one of the five counties participating in the 5C Program.

Implementation Measures for County Roads

Regional Water Board:
Measure
- The Regional Water Board shall consider adopting a resolution and accompanying waiver for maintenance of county roads certifying the Five Counties Salmonid Conservation Program (5C Program) if it complies with the TMDL and attains standards in accordance with California Impaired Waters Guidance.

Timeline
- December 2010

Measure
- In the event that a county does not show intent to implement 5C, develop Waste Discharge Requirements or a waiver of WDRs for that county.

Timeline
- June 2011

Siskiyou, Humboldt, Del Norte and Trinity Counties:
Measure
- Implement measures through the Five Counties Salmonid Conservation Program.

Timeline
- Pursuant to the 5C Program timelines

6.5.5.6 California Department of Transportation
In the Klamath River basin within California, Caltrans has jurisdiction over segments of three state highways: State Route 96, State Route 169, and State Route 299. There are also two segments of the federal transportation system that Caltrans manages and maintains within the Klamath River basin in California: U.S. Interstate Highway 5 and U.S Interstate Highway 101. Discharges of waste from Caltrans' facilities are regulated by the State Water Board under the NPDES Permit for Caltrans (Order No. 99-06-DWQ and NPDES No. CAS000003), adopted on July 15, 1999. The State Water Board is in the process of revising the Caltrans NPDES permit with input from the Regional Water Boards.

The Klamath TMDL analysis identified Caltrans facilities as contributing to water temperature impairments mainly through the discharge of excess sediment (e.g. eroding

shoulders, failed culverts, and unstabilized cut and fill slopes). The Klamath implementation plan recommends measures for Caltrans to implement basinwide through their Statewide NPDES permit. The Scott and Shasta TMDL implementation plans also address discharges from Caltrans facilities and both require the Regional Water Board to evaluate the adequacy of the Caltrans NPDES permit. Since the permit is being revised, there is an opportunity to incorporate TMDL measures for all three TMDLs into the permit based on the Regional Water Board's evaluation. The Klamath implementation plan makes the following recommendations concerning Caltrans facilities:

1. Include measures in the revised NPDES permit consistent with the Guidance to Control Excess Sediment for Caltrans facilities in the Klamath basin.
2. Incorporate measures to protect riparian shade in the revised NDPES permit and in 401 water quality certifications, and
3. Remove barriers to migratory fish passage associated with Caltrans road and highway facilities in tributary creeks identified in the Thermal Refugia Protection Policy.

Senate Bill 857 (Kuehl 2005), enacted into law effective January 1, 2006, requires Caltrans to prepare a yearly report describing its efforts to assess and remediate the negative impacts of state highway or road structures that serve as barriers to migratory fish passage. This mandate is consistent with the goals of the implementation plan to protect and provide access to thermal refugia in and around the mouths of tributaries to the mainstem Klamath River. There are several barriers to migration along Highway 96 caused by undersized culverts and the presence of the highway. If fish barrier removal in thermal refugia cannot be incorporated into the NPDES permit, the implementation plan contains a recommendation to Caltrans to implement this measure.

Implementation Measures for Caltrans Facilities

State Water Board and Regional Water Board:
Measure

- Incorporate the following measures into the Caltrans NPDES permit:
  1. Inventory: Identify sources of excess sediment discharge or threatened discharge and quantify the discharge or threatened discharge from the source(s).
  2. Prioritize: Prioritize efforts to control the inventoried sediment sources based on, but not limited to, severity of threat to water quality and beneficial uses, the feasibility of source control, and source site accessibility.
  3. Schedule: Develop a schedule to implement the cleanup of controllable sediment discharge sites.
  4. Implement: Develop and implement feasible sediment control practices to prevent, minimize, and control the discharge.
  5. Monitor and Adapt: Use monitoring results to direct adaptive management in order to refine excess sediment control practices and implementation schedules until discharges are reduced to a level that meets the TMDL load allocations and water quality standards.

- Incorporate measures to meet the riparian shade allocation into the Caltrans NPDES permit and 401 water quality certifications.

Timeline

- The revised statewide Caltrans NDPES permit is scheduled for adoption by the State Water Board by April 2010, with USEPA adoption anticipated by August 2010.

Caltrans:

Measure

- Implement the measures outlined above to control the discharge of excess sediment from their facilities and comply with the Klamath TMDL allocations and targets, even if measures are not incorporated into the statewide permit.

Measure

- Implement measures to meet the riparian shade allocation, even if measures are not incorporated into the statewide permit.

Measure

- Fully assess all barriers and potential barriers to migration caused by Caltrans road and highway facilities along the Klamath mainstem in the tributary watersheds identified in the Thermal Refugia Protection Policy. Develop a priority ranking and time schedule for modifying the identified fish passage barriers to accommodate free passage of fish upstream and downstream.

Timeline

- Caltrans shall submit an annual report to the Regional Water Board documenting measures taken to address fish passage barriers caused by its facilities.

6.5.6 *Agriculture (Grazing and Irrigated Agriculture)*

Agricultural activities in the Klamath River basin have the potential to contribute to TMDL impairments mainly through erosion, alteration of riparian functions, discharge of nutrients and organic matter, and water diversions. Grazing on nonfederal lands in California occurs mostly in the tributary basins in the upper middle reach of the Klamath River from Scott River to Iron Gate dam, including the Scott and Shasta River basins, and in the Lost River basin that drains into the Klamath River in Oregon. Irrigated agriculture occurs in the Klamath River basin in California mostly in the tributary basins in the upper middle reach of the Klamath River from Scott River to Iron Gate dam, including the Scott and Shasta River basins, and in the Lost River basin that drains into the Klamath River in Oregon. The Regional Water Board currently does not regulate agricultural activities in the Klamath River basin, except through waivers of WDRs adopted as part of the Scott River and Shasta River TMDL Action Plans or through an NPDES permit if an operation is classified as a concentrated animal feeding operation (CAFO).

6.5.6.1 Responsible Parties

Parties conducting activities associated with irrigated agriculture and grazing that discharge waste or have the potential to discharge waste in the Klamath River basin in California

6.5.6.2 Implementation

Several changes have been made in the regulatory approach to grazing and irrigated agriculture based on comments received during the public comment period since the last draft. Many of the commenters stated that the draft implementation measures were confusing and did not provide for a streamlined regulatory approach. Staff also received numerous comments on the proposed agricultural waiver and the interim waiver requirements for agriculture proposed in the June 2009 draft. The interim waiver would have required agricultural dischargers to comply with various implementation measures, which included the development of a water quality management plan. Commenters stated that they were not aware that the Klamath TMDL would impose additional requirements on responsible parties in the Scott and Shasta basins, where landowners are already subject to the requirements of previously adopted TMDLs. Staff also received comments stating that stakeholders were not involved enough in the development of the recommended implementation measures for agriculture and called for a public process to develop the waiver.

Staff considered comments and the potential for overlapping regulatory requirements in the Klamath Basin and decided to remove the recommendation of an interim waiver and specific requirements in order to allow time for the agricultural conditional waiver program to be fully developed. It is staff's intention that the stakeholder process will lead to a sensible agricultural program developed in collaboration with the regulated community and all interested stakeholders. The Regional Water Board will initiate the stakeholder process after adoption of the TMDL. In the interim time period before the waiver is adopted, the Klamath implementation plan encourages several steps for landowners to take that will help to develop the waiver program:

1. Document past projects and current practices that address sources of pollution from their operations.
2. Organize into watershed groups to report to the Regional Board as a group as part of the future waiver program.
3. Participate in the development of the conditional waiver through a Technical Advisory Group that will convene to develop the draft waiver by December 2011.
4. Attend water quality training on implementing management practices and/or water quality management plan development.
5. Sign up on the Regional Water Board Klamath River TMDL mailing list to receive information about the development of the waiver and water quality training.

6.5.6.3 Content of the Future Agricultural Waiver

Staff also received comment concerning specific requirements for agriculture and the content of the proposed waiver program. Regional Board staff have not yet decided on the appropriate recommendations, which will depend the outcome of the stakeholder process. The issues that were raised by the commenters will be included on the agenda for the stakeholder meetings. In general, the agricultural waiver would support a locally driven landowner effort to control these sources of pollution and report on progress to the

Regional Board. There will also be a provision to define and allow de minimus discharges under the waiver program.

Under the conditions of the waiver, agricultural owner/operators would work towards meeting water quality standards for the State of California. Compliance would be achieved by actively identifying sources of pollution, implementing management practices to control those sources, documenting efforts, monitoring, and reporting to the Regional Water Board. It is generally the owner/operator's responsibility to select the management practices that are most effective at controlling pollution from their lands. The Regional Water Board staff are considering developing a checklist to assist in the selection of the appropriate management practices and also to serve as the reporting mechanism to track compliance.

The Regional Board is flexible in its approach to a waiver and would like to incorporate existing programs and input from the affected communities as part of the process. The information provided below is intended to provide an idea of what a conditional waiver for agricultural activities might look like and to solicit input on its development. These provisions are not requirements of the Klamath TMDL and are provided for informational purposes only.

To address sources of pollution, the waiver may include conditions such as:

1. Minimizing water contact with animal manure and preventing livestock from damaging streams and riparian vegetation
2. Managing riparian areas
3. Controlling nutrients and elevated temperatures in tailwater.

The State Nonpoint Source Program Plan provides performance standards called 'management measures' to guide implementation of water quality control practices. The management measures are grouped into the following categories in the plan:

- Erosion and Sediment Control
- Nutrient Management
- Irrigation Water Management
- Grazing Management
- Pesticide Management

These management measures are available at the following website: http://www.waterboards.ca.gov/water_issues/programs/nps/docs/guidance/agricmms.pdf.

Examples of management practices that may be implemented to meet the NPS Program Plan management measures are provided by the following references:

- USEPA *National Management Measures for the Control of Nonpoint Pollution from Agriculture* is available from the USEPA or may be printed from the following website: http://www.epa.gov/nps/agmm/index.html.

- The National Resource Conservation Service (NRCS) Field Office Technical Guide is available from the NRCS or at this website: http://efotg.nrcs.usda.gov/treemenuFS.aspx

6.5.6.4 Monitoring and Reporting

The waiver must contain monitoring and reporting conditions to track compliance with water quality standards. Enrollees in the waiver would have the option of reporting to the Regional Water Board either individually or as part of a group organized by a third party such as the local resource conservation district or watershed council. The Regional Water Board would review the effectiveness of the waiver program at least every five years and make changes as needed considering discharger compliance rates and water quality conditions. The monitoring and reporting requirements would be developed to achieve the following objectives:

1. Document the implementation of management practices selected to address water quality problems associated with agricultural operations
2. Evaluate the effectiveness of the selected practices
3. Measure long-term trends in water quality to evaluate the overall effectiveness of the waiver program. Long term trend monitoring may be done through either an existing group monitoring program or a through a group program that is developed to track compliance with the waiver.

6.5.6.5 Other Regional Board Agricultural Programs Around the State

There are agricultural waivers in place for Regions Water Boards 2 (San Francisco), 3 (Central Coast), 4 (Los Angeles), 5 (Central Valley), and 9 (San Diego). A description of the current North Coast Regional Water Board (Region 1) existing interim TMDL waivers and the agricultural waiver programs in Region 2 and 3 is provided below as examples of existing agricultural regulatory programs in California. More information about these programs can be found on each region's respective websites that can all be accessed from www.waterboards.ca.gov.

Region 1

The North Coast Regional Water Board adopted two separate waivers as a part the Scott and Shasta basin TMDL implementation plans. These waivers have been in effect since adoption of those TMDLs in 2005 and 2006 respectively and will expire in five years from the date of adoption. The waiver requires responsible parties in those basins to participate in ongoing programs that address discharges that contribute to TMDL impairments. Staff have periodically updated the Regional Water Board on the progress of implementation in the Scott and Shasta basins. The Regional Water Board will consider whether or not to extend the TMDL waivers when they expire in 2010 for the Scott basin and 2011 for the Shasta basin. The Regional Water Board may decide not to extend the existing TMDL waiver and instead incorporate the measures in the Scott and Shasta implementation plans into the development of the agricultural waiver proposed in the Klamath TMDL to make requirements of agricultural discharges more consistent throughout the basin.

Region 2

The San Francisco Regional Water Board (Region 2) adopted a waiver to regulate discharges associated with grazing activities in the Tomales Bay basin in July 2008 as part of TMDL implementation in that basin. The waiver requires the submittal of a Notice of Intent (NOI) to enroll in the waiver program, due in January 2009. It also requires ranchers to develop a Farm Plan by November 2009 and keep it onsite. The NOI asked for the address of the owner/operator, identification of the receiving water(s), whether a farm plan has been completed or will be by November, and if the facility is in compliance with the waiver conditions. The waiver requires annual certification which consists of the submittal a single page of the farm plan template that was provided to ranchers. The submittal page asks for

- the name/address/APN
- when a ranch plan is to be completed or when it was completed
- the dates of compliance monitoring inspections performed during the wet season and dry season
- when a survey of streams on the ranch was completed
- whether further BMPs are needed and if yes when such projects will be completed.

The Farm Plan is a fill in the blank exercise and includes the following required information:

- Property information
- A field assessment with a checklist addressing rangeland conditions, roads, livestock distribution, manure management, and mercury.
- A stream assessment with a similar checklist addressing the stream channel, stream temperature factors, and algae growth in the stream.
- A list of past water quality projects completed is optional but information regarding future water quality projects is required.

Region 3

The Central Coast Regional Water Board (Region 3) adopted a waiver to address all discharges associated with irrigated lands in July, 2004. The waiver required the submittal of an NOI by January 1, 2005; 6 months after adoption of the waiver. Their NOI form requested basic information such as address, whether monitoring would be done as a group or individually, whether a farm plan has been completed, and the hours of water quality education that had been completed. It also required the following to be submitted alongside the NOI:

- A ranch information form that asked for the APN, the types of crops grown, how many acres of sprinkler irrigation, flood irrigation, etc.
- A map of the property
- A certificate of completed education if applicable
- A management practices form that consisted of a checklist of about 40 questions in four categories: pesticide management, irrigation water management, nutrient management, and erosion control. The rancher could circle ‘yes, I am doing this’, ‘no, but I plan to within 3 years’, or ‘no and not planned’.

Implementation Measures for Agriculture

Regional Water Board:
Measure
- Develop a conditional waiver of WDRs for discharges associated with agricultural activities, including grazing and irrigated agriculture, in the Klamath River basin. The waiver/WDRs shall require compliance with the Klamath TMDL watershed-wide allocations where they apply in the Klamath River basin.

Timeline
- Regional Board staff shall propose the conditional waiver for Regional Water Board consideration by December 2012.

Any party conducting activities associated with irrigated agriculture in the Klamath River basin in California:
Measures (recommended)
- Document past projects and current practices that address sources of pollution from their operations.
- Organize into watershed groups to report to the Regional Board as a group as part of the future waiver program.
- Participate in the development of the conditional waiver through a Technical Advisory Group that will convene to develop the draft waiver by December 2011.
- Attend water quality training on implementing management practices and/or water quality management plan development.
- Sign up on the Regional Water Board Klamath River TMDL mailing list to receive information about the development of the waiver and water quality training.

Timeline
- From Regional Water Board adoption of the Klamath TMDL until adoption of the conditional waiver addressing agricultural discharges

6.5.7 *Timber Harvest on Nonfederal Lands*

Timber harvest activities can impact water temperature and can contribute to dissolved oxygen and nutrient water quality impairments. The Klamath River TMDL implementation plan focuses on controlling sediment and protecting riparian functions from timber harvest activities to meet the watershed-wide TMDL allocations and targets. Timber harvest on nonfederal lands is currently regulated through a combination of general WDRs (Order No R1-2004-0030) and a conditional waiver of WDRs (Order No R1-2009-0038). The existing general WDRs and waiver contain a requirement that all provisions of the Basin Plan must be met to qualify for enrollment in the WDRs or waiver. By amending the Basin Plan through adoption of the Klamath River TMDL Action Plan, the requirement to meet the TMDL load allocations will be incorporated by reference into the existing general WDRs. The waiver contains TMDL requirements for temperature based on 85%/65% canopy, which is slightly different terminology from the Anadromous Salmonid Protection (ASP) Rules recently adopted by the California Board of Forestry. The implementation recommendations for shade conditions described below are consistent and equally protective as the shade conditions in the existing conditional

waiver of WDRs for timber harvest activities on nonfederal lands, and may be used for enrolling THPs under the waiver until the waiver is updated.

6.5.7.1 Responsible Parties

- Regional Water Board
- Any party conducting timber harvest activities that discharge waste or have the potential to discharge waste in the Klamath River basin

6.5.7.2 The General WDRs

In 2004, the Regional Board adopted Order R1-2004-030: *General Waste Discharge Requirements for Discharges Related to Timber Harvest Activities on Non-Federal Lands in the North Coast Region*. These General Waste Discharge Requirements (WDRs) rely on the *Forest Practice Rules* (FPRs) managed by CALFIRE as lead agency, as the baseline requirements to achieve water quality goals. Per CEQA, under separate and concurrent authority established by the Porter-Cologne Water Quality Control Act, the Regional Water Board may impose additional restrictions to achieve compliance with water quality standards. The WDRs require:

1) Notification of a discharge that violates water quality standards, and a schedule for addressing the problem.
2) Implementation of an ECP (similar to the ECP required by NTMP categorical waiver) for the project area.
3) Regular self inspections to track the effectiveness of implementation. Inspections are to take place before, during, and after the winter period.

6.5.7.3 Watershed-wide and Ownership WDRs

Timber companies and larger landholders may also be permitted through watershed-wide or ownership WDRs. Watershed-wide WDRs are issued for timber harvest activities within a specific watershed. The watershed may be fully contained within the permit holder's ownership, or the watershed may cross ownership boundaries. The ownership WDRs, on the other hand, may apply to the permit holder's entire property, crossing watershed boundaries. These WDRs represent a programmatic approach to addressing water quality concerns and are more comprehensive than the general permit or waivers. They can be made more specific to the ownership or watershed as a whole. Future ownership or watershed-wide WDRs adopted will incorporate measures necessary to meet the TMDL load allocations and water quality standards in the Klamath Basin.

6.5.7.4 Individual WDRs

The Regional Board may choose to regulate a given timber harvest project through individual WDRs if the General WDRs are not appropriate. Individual WDRs contain requirements that are more specific to the threats to water quality proposed by the THP. To implement the TMDL, the Regional Board will include Klamath implementation plan measures as part of individual WDRs for timber harvest activities in the Klamath Basin.

6.5.7.5 Board of Forestry Forest Practice Rules

Timber harvest on nonfederal lands is also subject to the requirements of the California FPRs. These rules were recently amended to include the *Anadromous Salmonid Protection Rules* (a subset of the FPRs that applies to CALWATER planning watersheds where populations of anadromous salmonids are currently present or can be restored). The FPRs may be sufficient to implement the Klamath TMDL in many situations; however, the FPRs may not always be protective enough to meet the water quality standards.

6.5.7.6 Riparian Shade Allocation and Temperature Water Quality Standards

The riparian shade allocation in the Klamath TMDL is based on the existing intrastate water quality objective for temperature. The allocation requires the shade provided by topography and full potential vegetation conditions at a site, with an allowance for natural disturbances such as floods, wind throw, disease, landslides, and fire. Regional Water Board staff prefer to rely on the FPRs to address water temperature concerns related to timber harvesting, and wish to avoid establishing different rules governing the same activity. Regional Water Board staff have reviewed the ASP Rules and determined that the new rules substantially increase riparian retention standards, and are much more protective of stream temperatures than the previous rules. However, while the ASP Rules are expected to address temperature issues in the majority of timber harvest situations, they do not ensure compliance with the temperature water quality objective nor the Klamath TMDL riparian shade allocation in all cases where they apply. There are instances where adherence to the ASP rules would result in a reduction in riparian shade and an increase in water temperature that is not consistent with the allocation or water temperature objective. An example of a circumstance where the ASP Rules are insufficient is in a 'Class II small' stream where they only require 50% canopy retention where cold-water dependent species are present. In addition, nothing in the ASP Rules prevents a five degree increase in water temperature due to the removal of riparian vegetation, which the temperature objective specifically prohibits. A significant gap in the ASP Rules is that they only apply in watersheds that are within the range of anadromous salmonids, while the water quality objective for temperature applies to all waters of the state, regardless of what species are present. Therefore to comply with the TMDL, responsible parties will be required to implement additional riparian shade protections where Regional Water Board staff determines that the ASP Rules are insufficient to meet the Klamath TMDL allocation. To meet the water temperature objective, which applies regionwide, and to address gaps in ASP riparian protections, it is recommended that this approach also be incorporated into all WDRs, and conditional waivers of WDRs regionwide.

6.5.7.7 Existing Plans and Programs

Parties conducting timber harvest activities in the Klamath Basin may have already developed property-wide plans that include water quality protections. Existing plans and programs may be used to fulfill the requirements of the TMDL. For example, industrial timber companies may be implementing a Habitat Conservation Plan (HCP) as part of their Endangered Species Act (ESA) compliance. To obtain a federal incidental take

permit, authorizing 'incidental take' of an ESA listed species, an applicant must submit a Habitat Conservation Plan (HCP) outlining what will be done to "minimize and mitigate" the impact of the permitted take. The impact of the 'take' in many cases relates to impacts on water quality, and thus the HCP in many cases contains water quality protections relevant to TMDL implementation. Green Diamond completed their HCP in 2007, which considers impacts to listed species on company lands and includes water quality protections. Another existing management plan that may be used in part to comply with the TMDL is the Non-Industrial Timber Management Plan (NTMP). NTMPs are developed by individual landowners with holdings under 2500 acres to comply with the FPRs and must include water quality protection measures. In either case, plans or programs may need to be updated, and/or additional measures may need to be developed and implemented in order to comply with the TMDLs and water quality standards. Regional Board staff will work with landowners to implement the Klamath TMDLs through these existing programs.

Implementation Measures for Timber Harvest on Nonfederal Lands

Regional Water Board:
Measure

- The Regional Board shall adopt individual watershed-wide and ownership WDRs, in lieu of the general WDR or conditional waiver of WDRs, to achieve the TMDL load allocations and water quality standards as needed and/or at the request of the discharger.

Measure

- Regional Water Board staff shall make recommendations for additional measures to ensure the water quality objective for temperature is achieved during the timber harvest review process, if necessary

Parties conducting timber harvest activities on nonfederal lands:
Measure

- Implement riparian management measures that meet the riparian shade allocations by implementing the *Anadromous Salmonid Protection Rules* (CDF, 2010). Where the ASP rules are not sufficient to meet the TMDL allocations, whether as a result of insufficient prescriptions or geographic limitations, implement additional measures as directed by Regional Water Board staff during the waiver/WDR enrollment process.

6.6 TMDL Implementation on Federally Managed Lands

There are two federal land managers in the watershed, BLM and the USFS. The USFS manages over half of the total acreage in the Klamath River basin in California on four National Forests: Six-Rivers, Klamath, Shasta-Trinity, and Modoc. Land use activities on USFS lands that were identified in the Klamath River TMDL as potentially contributing to the TMDL impairments include but are not limited to timber harvest, grazing, and road construction and maintenance. BLM manages small, isolated areas of land in the Klamath River basin in California, and therefore the implementation plan

focuses on the lands managed by the USFS. The approach to regulating USFS activities will inform our approach to BLM in the future.

The Regional Water Board regulates USFS timber harvest activities through an existing regionwide waiver of WDRs, and Regional Water Board staff are in the process of developing a new waiver of WDRs that would be expand oversight to most nonpoint source activities on lands managed by the USFS. The new waiver is scheduled to be considered by the Regional Water Board for adoption in April 2010 and would take the place of the existing timber harvest waiver. The waiver will implement applicable provisions of the State NPS Policy to establish a regulatory mechanism for all nonpoint source discharges. It will contain measures that implement existing TMDLs in the North Coast Region including the proposed Klamath TMDL. Meeting the conditions of the proposed regionwide waiver will be sufficient for TMDL compliance in the Klamath basin in California. The waiver is coordinated with existing USFS plans and programs that address water quality in the Klamath River basin and is being developed with input from the USFS. This section first gives the recommended implementation measures and then describes the water quality elements of existing USFS plans and programs and how they can be coordinated with TMDL requirements.

6.6.1 Responsible Parties

- Regional Water Board
- US Forest Service
- Parties conducting timber harvest activities on federal lands under the terms of a timber harvest sale contract.
- Parties conducting grazing activities on federal lands in designated grazing allotments.

Implementation Actions

Regional Water Board:

Measure

- Develop a conditional waiver of WDRs for nonpoint source activities on USFS lands that includes conditions that implement the Klamath TMDL.

Timeline

- To be proposed for consideration by the Regional Water Board in April 2010.

USFS:

Measure

- Conduct land management activities in compliance with the waiver of WDRs when adopted.

Timeline

- As required in the waiver of WDRs.

6.6.2 USFS Plans and Policies

As a manager of the National Forests, the USFS follows several policy documents and administrative rules that address water quality concerns The guiding policy for USFS

water quality management at the statewide level in California is the *Water Quality Management for Forest System Lands in California, Best Management Practices* (USFS 2000) guidance document developed jointly by the State Water Board and the USFS. The USFS adopted the federal *Northwest Forest Plan* (USFS 1994b) standards and guidelines, and the *Aquatic Conservation Strategy*. The National Forests have incorporated this policy direction into their forest level *Land and Resource Management Plans* (USFS 1994a, USFS 1994b, USFS 1994c, and USFS 1995). While Regional Water Board staff support these plans and policies as viable implementation vehicles, there is also an expectation that the plans be revised as necessary to comply with the TMDL. Regional Water Board staff will continue to work with the USFS to ensure these programs effectively meet TMDL allocations and targets in the Klamath Basin.

6.6.2.1 State Water Board and USFS guidance document

In 1981, the State Water Board and the USFS entered into a Management Agency Agreement (MAA) in which the USFS agreed to implement the 1979 *Water Quality Management for Forest System Lands in California, Best Management Practices* that protect water quality on USFS lands in California (USFS and SWRCB 1981). In 2000, the USFS revised some of the performance standards for meeting water quality standards and released an updated version of the *Water Quality Management for Forest System Lands in California, Best Management Practices* (USFS 2000) guidance document. The performance standards described in this document for different categories of land use are called 'Best Management Practices'. This terminology is slightly confusing because the document refers to performance standards as 'Best Management Practices' (BMPs) that are met through the implementation of appropriate management practices, whereas the term 'BMP' usually refers to the practices themselves. For example, in the guidance document, "BMP 2-7 'Control of Road Drainage' dictates that roads will be correctly drained to disperse water runoff to minimize the erosive effects of concentrated water flow" (USFS 2000). This is a performance standard that must be met through the implementation of on-the-ground practices that are not specified in the document, such as the installation of rolling dips or road outsloping. The USFS forms interdisciplinary teams to select the appropriate practices that meet the performance standards based on an assessment of project site conditions. It is essential that the practices selected to meet the water quality 'BMPs' be included in any project controlling documents to ensure practices are implemented as part of the project. Regional Water Board staff continues to actively work with the USFS staff to identify where and when the selected management practices are identified in their planning documents.

6.6.2.2 Northwest Forest Plan

The Northwest Forest Plan (NWFP) was adopted by the USFS in 1994 and is implemented by the National Forests in the Klamath River basin. The mission of the NWFP is to adopt coordinated management direction for the lands administered by the Federal government, including the USFS. The Northwest Forest Plan Record of Decision (USFS 1994b) presents a combination of land allocations and "Standards and Guidelines" for the management of those allocations. While the Standards and Guidelines consider more than just water quality protection, the NWFP also includes the Aquatic Conservation Strategy (ACS) that specifically focuses on water quality. Regional Water

Board staff support the objectives of the ACS as consistent with the objectives of Klamath TMDL implementation. The ACS can be found at: <http://www.reo.gov/library/reports/newsandga.pdf> (page B-9).

6.6.2.3 Land and Resource Management Plans

The USFS forest-level planning documents are called Land and Resource Management Plans (LRMPs). Each National Forest in the Klamath River basin has their own LRMPs that guide their land management activities. Shortly after the NWFP went into effect, the National Forests updated their LRMPs to incorporate the new Standards and Guidelines and the ACS. The LRMPs also incorporate the State Water Board and USFS guidance document described above. The Regional Water Board staff support the implementation of the LRMPs as a means to achieve the watershed-wide allocations and targets. The Regional Water Board will work with the USFS to update their LRMPs as necessary.

6.6.3 *Timber Harvest*

Currently, the Regional Water Board regulates timber harvest on federal lands through a conditional waiver of waste discharge requirements (Order No R1-2004-0015). The waiver and its regulatory requirements will be incorporated into the future waiver that addresses other nonpoint source activities conducted by the USFS. The current timber waiver contains requirements that will be carried over into the new waiver and will be coordinated with TMDL implementation. Per the current waiver conditions, the USFS must include water quality control practices from the *Water Quality Management for Forest System Lands in California, Best Management Practices* (USFS 2000) guidance document and conduct an analysis of the cumulative effects of the permitted project. The cumulative effects analysis uses one or more models to determine whether the proposed project will raise the local watershed above a predetermined 'threshold of concern'. If the watershed is found to be above the threshold, or the project will put the watershed over the threshold, the USFS is required to implement a monitoring plan for the project. The monitoring plan should be developed in part to track compliance with TMDL requirements.

6.6.3.1 USFS Water Quality Guidance Document

The 'BMPs' or performance standards for timber harvest activities are organized into the following categories: timber management, road and building site construction (related to timber harvest), vegetation manipulation, fire suppression and fuels management, and watershed management. For every USFS timber harvest project, an interdisciplinary team conducts an onsite evaluation of the project area to identify the applicable performance standards and appropriate management practices. The guidance document establishes the means for implementing the selected practices on the ground. "The appropriate BMPs, and the methods and techniques of implementing the BMPs, are included in the environmental documentation, permit, contract, or other controlling document used to conduct and administer the project" (USFS 2000).

Implementing this process for each USFS timber harvest project is essential to meeting TMDL requirements, and the USFS includes the selected practices in their project document prepared pursuant to the National Environmental Policy Act (NEPA). The

selected management practices must also be included in the timber sale contract or other controlling document used to administer the project as stated in the guidance document. Regional Water Board staff will review the NEPA document and any other controlling documents to ensure that the management practices proposed by the USFS meet the TMDL allocations and targets. Regional Water Board staff will continue to coordinate TMDL implementation with the USFS through the future waiver proposed for Regional Water Board consideration in April 2010. There is no need for additional TMDL implementation measures at this time. Regional Water Board staff will also work with the USFS to track progress towards meeting the watershed-wide targets and allocations.

6.6.4 *Grazing*

Grazing on federal lands principally takes place in the Klamath and Shasta-Trinity National Forests on designated grazing allotments. The allotments have been in use since the early 1900's and are mostly located in high mountain meadows closer to the headwaters of Klamath River tributaries. Grazing is managed by the USFS through the development and implementation of individual Allotment Management Plans (AMPs). Every year, the USFS develops Annual Operating Instructions (AOIs) for each allotment to implement the AMPs based on the current conditions of the allotment. Ranchers grazing animals on federal lands are required to follow the AOIs as well as meet the overall AMP objectives in order to continue grazing the allotment.

6.6.4.1 USFS Water Quality Guidance Document

The agreement on performance standards between the USFS and the State Water Board serves as the basis for controlling water quality impacts from grazing. An interdisciplinary team determines the management practices included in the AMP following an onsite evaluation of the project area. Regional Water Board staff are supportive of this process as a means to meet the TMDL allocations as long as the AOIs are effective and enforceable. The 'BMPs' or performance standards for grazing activities on federal lands identified in the guidance document include the following:

- *Range Analysis and Planning*: The district ranger is responsible for the analysis of range allotments and the preparation of AMPs. The permittee is expected to carry out the AOIs under the immediate direction and supervision of the district ranger.
- *Grazing Permit System*: Field checks and measurements will be made annually by the USFS. The grazing permit will be modified, cancelled or suspended in whole or part as needed to ensure proper use of the range resource and protection of other resources, such as water quality.
- *Rangeland Improvements*: The grazing allotment analysis may indicate the need for certain rangeland improvements such as further protection of sensitive areas, stream channel stabilization measures or water developments. The district ranger will assure that the permittee is involved as a cooperator in rangeland improvements (USFS 2000).

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The LRMP for the Klamath National Forest gives the following goals for grazing management that are consistent with TMDL implementation (USFS 1994a):

- Manage vegetation to provide for healthy ecosystems and to make forage available on a sustainable basis for use by livestock, wildlife and wild horses. Manage vegetation to provide for a desired condition of herbaceous shrub and forested vegetation according to site potential and resource needs.
- Manage grazing activities to not retard or prevent attainment of the Aquatic Conservation Strategy objectives.

Regional Water Board staff recommend that the USFS meet the above performance standards in their project document prepared pursuant to the National Environmental Policy Act (NEPA) as part of Klamath TMDL implementation. The management practices selected to meet the performance standards must be included in the grazing AMP, AOIs, and other controlling document(s) used to manage the allotment. Grazing activities on federal lands will be addressed as part of the proposed waiver of WDRs.

6.6.5 *Road Management*

The USFS is responsible for managing well over 10,000 miles of roads on federal lands within the Klamath River basin on four National Forests. This extensive road network has been identified in the Klamath technical analysis as contributing to the TMDL impairments. The water quality impacts of roads are described in section 5.2.1.2. The Klamath Implementation Plan focuses on road management in the Klamath, Six Rivers, and Shasta-Trinity National Forests.

Regional Water Board staff recommend that the proposed waiver of WDRs should require the USFS to continuously inventory and address sources of sediment from roads across its ownership as needed; similar to the process outlined in the Guidance to Control Excess Sediment. This approach is consistent with existing USFS programs to inventory and assess roads on federal lands. Existing programs are being coordinated with TMDL implementation and compliance with the proposed waiver.

6.6.5.1 USFS Water Quality Guidance Document

The guidance document describes 28 ‘BMPs’ or performance standards that must be met to control nonpoint source pollution from roads on federal lands. The BMPs address aspects of road management such as planning, erosion control, slope stability, stream crossing installation, riparian management, maintenance, decommissioning, and others. Klamath River TMDL implementation requires the selection and timely implementation of the appropriate management practices that meet the BMP performance standards in the guidance document. Staff recommend that the proposed waivers of WDRs for most nonpoint source activities on federal lands include, as a condition of the waiver, a requirement to meet the performance standards described in the guidance document.

6.6.5.2 USFS Road Maintenance Needs

The National Forests are directed by the USFS Road Management Policy (USFS 2001) to assess the status of the road network on National Forest lands and to minimize the network to the extent feasible. Part of the reason for this is that the National Forests, including those in the Klamath River basin, do not have adequate funding for maintenance of the current road network. Changes in timber harvest practices have also resulted in a reduction of the miles of road needed to manage timberlands. In the Shasta-Trinity National Forest, for example, only 20% of the roads are maintained to design standards, and as of 2002, there was a $76 million backlog of deferred maintenance (USFS 2002b). Without proper maintenance, roads have a higher probability of failing and contributing sediment that can alter stream temperatures. Regional Water Board staff support the USFS Road Management Policy and encourage the USFS to reduce road densities on federal lands through road decommissioning. Reducing road density has the added benefit of increasing infiltration, which can add base flow to Klamath River tributaries. Regional Water Board staff recognize that decommissioning roads is not always the most prudent use of available road maintenance funds.

6.6.5.3 USFS Road Management Policy

The National Forests are directed to reduce the impacts of roads on natural resources in the USFS Road Management Policy and the Northwest Forest Plan. The National Forests in the Klamath River basin are responding to this directive by assessing sediment sources and threats to water quality on National Forest land and implementing road restoration and decommissioning projects as funding permits. This existing assessment and prioritization process is consistent with the requirements of the Regional Water Board prohibition on the discharge of excess sediment and can be used to comply with the Klamath River TMDLs. The Regional Water Board will work with the USFS to ensure their efforts are consistent with TMDL implementation and water quality standards. The following are descriptions of the existing road management programs in each of the National Forests.

6.6.5.4 Existing Road Management in the Klamath National Forest

The Klamath National Forest (KNF) developed the *Klamath National Forest Forestwide Roads Analysis* (USFS 2002a) that addresses road impacts to natural resources and guides the restoration actions related to roads. To date, KNF staff have conducted Road and Sediment Source (RSS) inventories in the following watersheds: Elk, Indian, Irving, Ti, Clear, Dillon, upper Beaver, Grider, and Horse Creeks, and the Salmon and Scott Rivers. The RSS inventories identify "specific locations where road drainage structures and fill have the potential to adversely impact watershed processes, then assess the relative environmental risk of each site" (USFS 2002a). The completed inventories and sediment source ratings are used to prioritize road restoration projects in the KNF. KNF has implemented fixes on the top 10% of sediment sources identified in the RSS assessments. Road management measures are recommended as part of watershed levels analyses. Once Environmental Assessments for the analyses are completed, KNF will begin implementing road maintenance measures based on funding and priority.

6.6.5.5 Existing Road Management in Six Rivers National Forest

The Six Rivers National Forest staff analyze the road network by ranger district. *The Orleans Roads Analysis and Off-Highway Vehicle Strategy* (USFS 2006) (Orleans RAP) recommends road management measures in the Orleans Ranger District; the only Six Rivers district in the Klamath River basin. The Orleans RAP tiers to the *Six Rivers National Forest Roads Analysis*, which is a forest-level plan for roads. Where the forest-level plan only evaluates passenger car roads of Maintenance Levels 3-5, the Orleans RAP evaluates high clearance roads (Levels 1-2) and non-system roads in the forest. The findings of the Orleans RAP can be used to develop a prioritization strategy for road restoration work in the Orleans Ranger District. The analysis identified the following items that relate to controlling the impacts of sediment from roads in the Orleans Ranger District:

- needed and unneeded roads,
- site-specific priorities for improvements and decommissioning, and
- roads associated with environmental risk (USFS 2006).

Projects to implement the RAP will be funded based on availability of grants and data from the roads analysis. The Regional Water Board staff will work with the Six Rivers Forest staff on prioritization of road restoration work that will address the impacts of sediment on Klamath River tributaries and thermal refugia in the mainstem Klamath River.

6.6.5.6 Existing Road Management in Shasta-Trinity National Forest

The Shasta-Trinity National Forest staff completed their forest-level roads analysis in July 2002 entitled the *Shasta-Trinity National Forest Roads Analysis Report* (USFS 2002b). This forest-level analysis evaluates passenger car roads of Maintenance Levels 3-5 and makes recommendations regarding road maintenance needs and prioritization. High clearance roads (Levels 1-2) and non-system roads are evaluated in watershed-level analyses that tier to the forest-level analysis.

6.6.6 *Fire Management*

Wildfires are common during the summer in the Klamath River basin and can lead to severe impacts on water quality through the destruction of riparian vegetation and increased runoff and erosion rates. The fire regime in the Klamath River basin has been altered through years of suppression that has resulted in increased fuel loads and fire severity. The USFS carries out timber harvest projects related to fire management both to control fuel loads and to salvage timber after a fire. The Regional Water Board's current waiver for timber harvest activities on federal lands covers these projects. The USFS also takes measures to control erosion after a wildfire that focus on maintenance of drainage features and revegetation if needed. The practices for controlling post fire erosion sources are, in most cases, the same as those used to control erosion sources on forestlands with the added consideration of increased runoff volume. Regional Water Board staff recommend that the proposed waiver that will address most nonpoint source activities on federal lands include measures that address post fire sediment sources. The

following management measures are recommended to address potential water quality impacts of fire management activities:

- Hydrologically disconnect firelines;
- Remove all temporary crossings;
- Improve the existing road drainage system to handle post-burn flows;
- Clear blockages to restore drainage function;
- Remove minor slumps and slides where needed;
- Ensure the function of drainage systems after storm events; and
- Implement post fire revegetation on severe burns areas (an area where duff and overstory canopy consumption has occurred) considering steep slopes that statistically receive high rainfall as a priority. Burned areas that receive snow are less likely to cause erosion problems.

6.7 Klamath River Water Quality Tracking and Accounting Program

Regional Water Board staff, in coordination with ODEQ, US EPA, and PacifiCorp, have begun developing a Klamath River basin water quality improvement tracking and accounting program. The Klamath River basin has several attributes that could benefit from a water quality improvement tracking and accounting program. This program will provide a record of individual actions and, perhaps, the basis for a market that facilitates a higher level of activity and collaboration than could be achieved by a regulatory approach alone. These attributes include:

- A large, geographically complex watershed that straddles two states, six tribes and two EPA regions thus requiring a framework for project collaboration that extends beyond the jurisdiction of any individual participant;
- Numerous and diverse sources of water quality impairments that vary widely in costs and feasibility of control strategies;
- Significant influence of nonpoint sources of pollutants, particularly from upstream sources in the basin, on water quality throughout the basin;
- The presence of dams that are under consideration for removal in the relatively near future thus reducing the desirability of long-term investments in reducing their near-term water quality impacts; and
- A large number of regulatory programs with overlapping goals and drivers that would benefit from coordinated action.

The Tracking and Accounting Program provides a mechanism that would allow for collaboration among basin stakeholders on common projects while earning credit towards their regulatory requirements related to TMDLs and other mandated programs (e.g., KHSA interim measures, state and federal Endangered Species Acts).

6.7.1 *Program Goals*

The overall program goals are to provide a program to achieve water quality improvements required in all Klamath Basin TMDLs, in a manner that is consistent with state and federal policy and regulations, is technically sound, and is tailored to meet the

specific needs and conditions in the Klamath Basin. More specifically, the goals are to develop a basinwide accountability program to track water quality improvements, facilitate planning, and coordinate TMDL implementation based upon a market-like system. The Tracking and Accounting Program should also:

- Provide a decision tool to guide expenditure of implementation resources towards projects with greatest/earliest impact.
- Encourage the pooling of resources to support engineered solutions and enable the spending of resources across state boundaries by tracking and accounting for the contribution of each project participant.

6.7.2 *Program Objectives*

Establish and operate a program for tracking water quality improvements that:

- Encourages early reductions and progress towards water quality improvements;
- Reduces the cost of TMDL implementation through greater efficiency and flexible approaches;
- Creates economic incentives for innovation, emerging technology, voluntary pollutant reductions from all sources, and for potential trading and/or offsets amongst these sources;
- Achieves ancillary environmental benefits beyond the required reductions in specific pollutant loads, such as the creation and restoration of wetlands, floodplains and fish and/or waterfowl habitat;
- Establishes an accountability Program whereby a common metric (or sets of metrics) is/are used for estimating and tracking water quality improvements;
- Establishes a credible baseline, linked to the two states' TMDLs, and incorporates effectiveness monitoring and an adaptive management approach;
- Uses standardized protocols to quantify pollutant loads, load reductions, and credits/offsets, or other water quality improvements (e.g., stream channel restoration) that contribute to supporting conditions for beneficial uses;
- Recognizes cross-pollutant benefits (e.g. acknowledges that upstream nutrient reductions can improve downstream low dissolved oxygen levels and algal bloom conditions); and
- Allows participants to contribute to program-sponsored projects without having to develop partner-specific agreements or contracts thus minimizing administrative and transaction costs.

6.7.3 *Next Steps*

Regional Water Board staff are committed to the continued development and implementation of a water quality improvement tracking and accounting program, as stipulated in the Klamath River and Lost River TMDL Implementation MOA signed by the Regional Water Board, ODEQ, and US EPA Regions 9 and 10. The Regional Water Board has received federal funding to hire a contractor to work closely with PacifiCorp's contractors and support the Regional Water Board, ODEQ, and EPA in developing such a program. Regional Water Board staff plan to coordinate with stakeholders interested in the program in 2010.

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